POPULAR Computing WEEKLY

Only 50p.

25 September-1 October 1986

Vol 5 No 39

October arrival for Spectrum Plus 2

AMSTRAD PC
Full review inside
Starts on p17

Starts on p17

SOFTWARE

New fast Basic for the Atari STs

BMX Simulators and Asterix reviewed

NEWS DESK

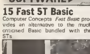
The Amstrad threat to Atari: Tramiel speaks out – p12

Beyond's Star Trek: exclusive pictures



Contents

SOFTWARE ▶





◀ HARDWARE

GAMES ▶

◀ PROGRAMMING

REGULARS ▶

Soundcheck will be back next week. Mark Jenkins is on holiday.

Editor Christina Erskine **News editor** John Lettice **Features editor** John Cook **Technical editor** Duncan Evans **Production editor** Michelle Beauchamp **Supplements editor** Christopher Jenkins **Supplements designer** Barbara Hajek **Advertisement and Promotions manager** Simon Langston **Assistant advertisement manager** David Osen **Advertisement executive** Jon Beales **Classified executive** Rodney Woodley **Editorial secretary** Annmarie O Dwyer **Administration** Geraldine Smyth **Managing editor** Peter Worlock **Publishing director** Jenny Ireland **Published by** Sunshine Publications Ltd, 12–13 Little Newport Street London WC2H 7PP Tel 01-437 4343 Telex 296275 Fax 01-439 0681 **Typeset by** Magazine Typesetters 5 Parnell Court East Portway, Andover Hampshire **Printed by** McCorquodale Magazines Andover, Hampshire **Distributed by** S M Distribution London SW9 Tel 01 274 8611 Telex 261643
 ISSN 0265 0509

Popular Computing Weekly. Tel: 01-437 4343.

ABC

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles and any accompanying programs should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here – so please do not be tempted. We cannot guarantee to return your programs – so please do not send your only copy. **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish although we will always try our best to make sure programs work.

No Plus 2 till October

THE Spectrum Plus 2 isn't now expected in the shops until mid October, despite the fact that it was launched at the beginning of this month. At the launch of the machine at the PCW Show Amstrad said that it was "due in the British High Street later this month," but both WH Smith and Amstrad Distribution say it's not expected in the stores for another three weeks.

The delay is unusual for Amstrad, which doesn't usually announce machines until they're ready to go into the stores, and it's not clear if there's any problem with the machine.

As it is practically identical to the Spectrum 128 it's unlikely that there could be a design problem, but it may be that Amstrad is finding to make the machine load both old and new software.

The company will however be spending £2.4 million on advertising the machine this Christmas, and Barry Young, managing director of Amstrad Distribution is predicting that it will take 40 per cent of the games machine market over the next few months.

The new Amstrad PC is however ruffling feathers among some dealers. Amstrad will only sell the machines through what it describes as "approved Amstrad dealers," and Amstrad Distribution has sent out a letter detailing the requirements for this.

"Unless you are able to meet the criteria as specified, then please do not waste our time or yours," it reads winningly.

The major requirements are that shops selling the PCs should have a "Business Computer Centre," with two staff trained in the Amstrad range and facilities for individual hands-on demonstrations. The Centre should also be separated from home computers and games software. These conditions are liable to cause severe space and staffing problems for small dealers, but will also mean that many major multiples will need to reorganise their stores.

From Amstrad's point of view it could however be useful to have smaller dealers ducking out of the PC range and continuing to stock the PCW, as this will avoid the two machines getting into too close competition with each other.

Low-cost hardcard planned for PC

AMSTRAD is now predicting that first shipments of its PC will arrive at the end of this week. It is however, unlikely that hard disc versions of the machine will be available for some time yet, and third parties are already gearing up to plug the gap.

Foremost among these is distributor Northamber, which has been taken on by Amstrad to supply the PC and which hopes to secure a supply of hardcards this week.

A hardcard is basically a small Winchester hard disc mounted vertically on a card which is plugged into a PC's expansion slot, and has the advantages of being easy to fit and allowing both floppy drives to continue to be used. Amstrad's hard disc on the other hand fits into the position normally used by one of the floppies.

Northamber is reluctant to talk about the cards, but it's believed they'll be available in both 10Mb and 20Mb versions. According to spokesman, Eddie Moore, the cost will be comparable to Amstrad-supplied hard disc machines and less than an Amstrad upgrade.

Like the Amstrad hard disc units they will take up one of the machine's three available expansion slots, but because of the width of the card they'll also limit one other slot to a half length card. Because the Amstrad already has most of the Ram and I/O you'll need on board, this, however, is unlikely to be a problem.

A hard act to follow

Correction

Those of you who have been following the *Popular* vs *Colossus* chess game and are wondering how on earth the bishop managed to move from f1 to c6 in game one, need wonder no longer.

The move should have read 38 f1–c4. The collators will take this into account when deciding the next readers' move.

PCW now stores more

YET another company is to supply a hard disc unit for the Amstrad PCW. The latest upgrade is from ASD Peripherals, and costs £574 for a 10Mb drive and £689 for the 20Mb. The units are external and include an extension to the PCW's expansion bus so that all existing add ons can be used at the same time.

The complete setup consists of a controller module which plugs into the expansion socket of the PCW and a combined drive unit and power supply that sits under the PCW itself.

Details from ASD Peripherals, 03224 49235/6

Amstrad PC user group

A user group for the Amstrad PC has been formed already. The 1512 Independent User Group intends to publish a regular newsletter, run a helpline, offer software discount, hold meetings and run a public domain software library. Membership is £20 a year. Further information is available from Paul Mullen on 0732 450808

Sidecar to launch soon?

COMMODORE is thought to be preparing to launch Sidecar, its PC emulator for the Amiga, in the UK shortly. Price isn't yet certain, but according to a source within the company it's to be pitched low to match the price of the Amiga 3, the new entry-level Amiga Commodore intends to announce at the US Comdex show in November.

Commodore UK general manager Chris Kaday is still adamant that there will be no new Amigas in the UK, either announced or in the shops, before Christmas, and although a spokesman confirmed that there would be an announcement from the company this week he categorically denied that it would be Amiga-related.

Kaday however doesn't rule out the possibility of new products being shown elsewhere in the world. Commodore US is currently thought to be working on both the Amiga and the 64 range, with the Ranger, a 68020 machine coming in above the current Amiga and a lower cost development, the Amiga 3, coming in under it.

The 64 range is also thought to be undergoing revision. The recently launched 64c is being viewed by industry sources as a stop-gap machine that will be the subject of development, reducing the chip set to make it cheaper to produce and easier to upgrade. This of course clashes with the 128 which was originally intended as the upgrade path for the 64, but which is expensive to build and has largely failed to displace the older machine.

Commodore UK denies that it is withdrawing the machine, but of the two models only the 128D, which is too expensive for a mass-market machine, is now readily available in the UK. The company therefore needs to be able to price its 8-bit machines lower if it is to remain in the home market.

Acorn shows up in Manchester

THIS weekend's Electron and BBC Micro User Show will feature Acorn itself showing its new Master Compact machine. Among the launches expected are a £700 Winchester system, £79 Master console unit and a £16.95 Rom cartridge adaptor from Viglen, while Care Electronics will be showing cheap Master cartridges and an extender to allow old Rom cartridges to work on the new machines.

Among the other companies present will be Norwich Computers, showing a utility Rom for Wordwise Plus, and Advanced Computer products with a new disc interface for the Electron.

First launches £50 PC integrated package

PRICES for integrated software packages for the PC are set to tumble shortly with the launch of Decision Director, a £49.95 combination spreadsheet and word processor from First Software. As the package will be priced lower than most PC word processors it should provide stiff competition for the reduced price Framework (see separate story) despite the fact that it doesn't include a database.

First will also be importing a new database, Able, to be priced at £86. This again will be under the predicted price for the PC1512 version of dBase II.

Details from First Software, Unit 20D, Horseshoe Road, Horseshoe Park, Pangbourne, Berks RG8 7SW (07357 5244).

Software Hotlines

Not wishing to repeat the fiasco of their last major licensing deal (*Superman*), **Beyond** is pulling all the stops out for *Star Trek* – as the development versions so far indicate (see below). It's big (1000 stars), complex (255 subplots) and looks lovely on the telly (lots of digitised pictures of crew members, etc).

The plot has the Enterprise investigating the mysterious defection of Federation starships within an area of space called 'The Quarantine Zone', centred around the planet Adakiak. Tricky stuff. If they don't run out of memory, it could well be the game of the year ... although exactly which year is still uncertain.

It's official – multi-player stand alone arcade games are in, the whole thing started off around a year or so ago in this country with that one to four player fantasy adventure from **Atari**, *Gauntlet*, soon to be emulated in some fashion by **US Gold** (*Gauntlet II* – a two player adaptation – should be hitting the arcades soon). Then came **Sega's** attempt at the multi-player market, *Quartet*. Although placed in a space age setting, this shoot-'em-up was never as graphically impressive as *Gauntlet*.

This was followed by *Super Sprint*. Again from **Atari** this is 1–3 player racing game derived from their mid-seventies game *Sprint*. Possibly the best game in the arcades at the moment.

Kirk quarantined

Electric Dreams is in negotiations presently for the home computer rights. But who is going to be the first to go for *Rampage* – the latest multi-player from **Bally-Midway**? This is a 1–3 player game in which you each play a gigantic gorilla taking apart an American city – complete with National Guard sharpshooters and innocent civilians to stomp. Straight out of King Kong, expect one of the big boys to snap this one up pronto.

Here's a heartening tale for any lone programmer. Dominic Robinson started on a BSc Computing course at Bristol University – but decided that they weren't teaching him the kind of things he wanted to know. After leaving he messed around a bit on his Spectrum, came up with a few ideas on how to implement *Undium* on it ... then went to visit Hewson.

Hewson by coincidence, had already been thinking along the same lines – so the company took him on, and the rest is history. Everyone that saw the demo at the PCW show couldn't fail to be impressed – it'll be out on 28 October.

John Cook

Enterprise zone

Apple launches new 16-bit IIGS

APPLE'S follow-up to the Apple II, the IIGS is to go on sale towards the end of the year at an entry-level price of £995. The machine is compatible with the II series – which it will replace – but uses the 65C816 processor which is the 16 bit version of the 6502 used in the Apple II.

The Basic system consists of 256K Ram monochrome monitor, mouse and external 3½ inch 800K drive unit. The main system unit has composite and RGB outputs, headphone jack, bus input port, disc interface for both 5¼ inch and 3½ inch drives, twin serial ports, communications chip and joystick port. It also has eight expansion slots, and sports a synthesiser chip. Ram can be expanded to 8Mb and the 128K Rom to 1MB and resolution is 640 × 200 with seven display modes.


The new Apple

Apple confirms that the IIe and IIc are now dead, and in this country proposes to target the new machine at small businesses and at the II's existing user base. An upgrade for existing users will be available in the US, but Apple UK is unlikely to bring it into this country.

Horse feathers KBS' nest

KBS Interactive Software considers that its latest idea is a runner. The company claims to have been working on the use of expert and rule-based micro systems for use in everyday applications and, says Cliff Walden-Goodwin, "We decided to apply rule based theory to what must be every punter's dream – making a profit at the races."

KBS claims a success rate of 80 per cent plus and is to launch the system on the open market at the beginning of next year. Punters eager to press money into KBS' hands before then should however bear in mind that similar computerised systems were being blamed for last week's spectacular crash on the New York Stock Exchange.

In a separate initiative KBS is also opening a software factory near its Tyne & Wear base. The idea of the factory is to offer young programmers working space and office facilities for £12.50 a week, and to try to encourage a cross flow of business between the programmers and KBS. Interested parties should phone 0207 543053.

M&M Technix's new buffer

NLQ extras for Epsons

THE M&M Technix NLQ Printer Buffer is a buffer and NLQ upgrade for dot matrix printers. The buffer size can be either 8K or 32K while the NLQ feature, which requires an Epson-compatible printer with quad-density graphics, allows print in four character sizes and a variety of fonts. Three of these are supplied with the buffer, and further versions can be obtained from M&M. The units cost £128 for 8K and £164 for 32K.

Details from M&M Technix, Abindon Business Centre, 346–376 Osmaston Road, Derby DE2 8AG.

Cheap dBase out soon for the PC

A £120 version of *dBase II* should be available for the Amstrad PC later this year. The program is already available in CP/M format for the Amstrad PCW but like other major software producers publisher Ashton-Tate had until recently set itself against price cuts on its PC software range.

But now in a spectacular volte face A-T has bowed to the inevitable and has invited tenders from third party distributors to handle support and marketing for both *dBase II* and a low-cost version of the *Framework* integrated package. The latter will be cut down to avoid damaging the company's existing market for the full version but *dBase II*, which has to an extent been superseded by *dBase III*, will be practically a full version.

Mailmerge for Locoscript

QMAIL is a mailmerge utility designed to work with Locoscript. It supports right justification, tabs and centred text and allows you to select particular people from your list before doing a mailshot. It costs £29.95.

Details from Proteus Computing, 2 Iffley Road, London W6 (01-748 2302).

Real-time clock for the 64

ELECTRONIC and Computer Workshop has produced a battery backed CMOS Ram and real-time clock plug-in module for the Commodore 64. The module's timing facilities aren't affected by the 64's internal timings, which are often interrupted, and it includes 50 bytes of CMOS Ram which can be used to store information such as set-up data even when the machine is switched off. The module costs £36.11 in kit form or £60.45 ready built.

Details from Electronic and Computer Workshop, 171 Broomfield Road, Chelmsford, Essex CM1 1RY (0245 262149).

New printers from Citizen

CITIZEN has launched three new printers – two in its MSP series and one new high quality model the HQP 45

The MSP 10E and 15E are functionally indentical, but the 10E is 80 column while the 15E is 136 Draft output speed is 160 cps and near letter quality 40 cps The machines have 8K buffer, full bit image graphics, proportional spacing and Epson and IBM compatibility built in. They cost £349 and £449 respectively

The HQP 45 prints at 1200 cps in draft 132 cps in correspondence and 66 cps in letter quality It has 136 column width, Centronics and RS232 interfaces as standard, and optional IBM and Espon emulation The HQP 45, which costs £935, has a 24K buffer and can take additional plug-in fonts

Details from Hillingdon Itec, Norland House, Wallingford Road, The Trading Estate Uxbridge, Middlesex Tel 0895 56849, Prestel mailbox 0895 31726 or 0895 59842 for viewdata access

Viewdata for free

THE Middlesex Training Centre has set up a free viewdata service whose subject matter ranges from local Hillingdon information, through computer news, to information about the centre itself The service includes a wide range of machine specific databases and a mailbox facility, and runs 24 hours a day, 365 days a year

CD survey published

CD-ROM Standards The Book is the latest phase in the micro industry s plans to develop a standard volume and file structure for CD-Rom drives The book puts forward the standard proposal developed by the High Sierra (no relation to the film of the same name) Group, leading participants in which include DEC Apple and Microsoft It is described by the publishers, Learned Information and Infotech as the ' definitive guide to CD-Rom standards, and is being sold for £50

Details from Learned Information Woodside Hinksey Hill, Oxford DX1 5AU Tel 0865 730275

Smart switches for Data

CRAFT Data is now importing a range of switch devices, designed by US company Via West to allow micros to share peripherals The switches cover IBM Centronics RS232 and other common interfaces, and switching between devices can be either manual or through software They need no external power supply and start at £30

Details from Craft Data 92 Broad Street Chesham, Bucks HP5 3ED Tel 0494 778235

User group with Flare

FLARE Technology s Ram Music Machine has acquired an official user group just weeks after its launch Price and benefits of membership had yet to be fixed as *Popular* went to press, but further information is available from organiser Al Straker, 19 Sandringham Road, London NW2 5TP

Taspro goes onto Amstrad

TASPRO, Seven Stars *Tasword* utility which allows proportional spacing in justified *Tasword* copy, has now been converted to run with *Tasword 464* or *464 D* The program includes pause control for daisywheels, allowing printwheels to be changed during printing, and handling of alternate mode characters in Epson FX80 proportional mode It can also justify redefined characters and supports a wide range of printers Price is £7 95

Details from Seven Stars Publishing 34 Squirrel Rise, Marlow Bucks SL7 3PN Tel 06284 3445

ST gains Transputer

KUMA is selling its K-Max parallel Risc processing system for the ST for a cool £1,706 The system consists of a dual processor board containing two Inmos Transputers and two blocks of Ram of 256K each The system has a potential speed of 15 Mips (million instructions per second)

Technical freaks can get details from Kuma, 12 Horseshoe Park, Pangbourne, Berks RG8 7JW Tel 075357 4335

Correction

In *Popular* September 11, we inadvertently gave the incorrect number for Memotech Computers, in a reply to a letter

The correct number is 0993 78691 and Memotech's new address is Unit 24 Station Lane Industrial Estate Witney Oxon

Diary Dates

SEPTEMBER

26–28 September
Electron and BBC Micro User Show
UMIST, Manchester
Details Software, hardware and peripherals for BBC machines
Price £3 adults, £2 children £1 discount for advance booking
Organiser Database Exhibitions, 061-456 8835

OCTOBER

3–5 October
The Amstrad Computer Show
Novotel London
Details Home and business software and hardware for the Amstrad range
Price £3 adults £2 children £1 discount for advance booking
Organiser Database Exhibitions 061-456 8835

4 October
2nd Welsh Dragon Computer Show
Cardiff–Wales Airport
Details Software and hardware for the Dragon
Price £1 adults, children and OAPs 50p
Organiser John Penn, 04203 5970

30–31 October
Hampshire Computer Fair
Guildhall Southampton
Details. Business computers
Price Free entry by business registration
Organiser Testwood Exhibitions, 0703 31557

NOVEMBER

7–9 November
Electron and BBC Micro User Show
New Horticultural Hall Greycoat Street London SW1
Details Hardware, software and peripherals for the Electron, BBC micro and Master series.
Prices. £3 adults, £2 children £1 discount for advance booking
Organiser Database Exhibitions, 061-456 8835

8 November
UKEUG National Einstein Show
National Motor Cycle Museum, Birmingham
Details Einstein software and hardware
Price Free
Organiser UKEUG 07982 2399

Prices, dates and venues of shows can vary, and you are therefore strongly advised to check with the show organiser before attending *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser

Letters

Star Letter

To dump on K-Graph

We appreciated your publication of a review of our business graphics package *K-Graph* for the Atari ST series in last week's edition of *Popular Computing Weekly*.

Unfortunately the reviewer seems to have been unable to print a screen dump and claims it cannot be done, this is incorrect. Up to four windows can be displayed on the screen simultaneously, this would be pointless if the display could not be printed. To obtain a screen dump all the user has to do is pick up the 'Picture Icon' and drop it on the 'Printer Icon', exactly as described on page 55 of the *K Graph* manual.

An example of the results obtainable by the above method can be seen in our enclosed software leaflet.

All the printing is done by using icons and drop down menus, we were surprised that this is 'too fiddly' for Mr Evans, there are certainly several options built in, though none of these could be described as difficult.

Jon Day
Sales Manager
Kuma Software

Xen X2

Looking at the two articles on Xen-Basic (*Popular*, September 4/11), may I make two points?

Firstly, the command |*Proglen* can be used on CPC 664s and 6128s by changing two numbers in Line 200 – the number 131 in the fourth row of Line 200 becomes 102, and 129 on the fifth row becomes 100. These are the low bytes of the addresses where the end and start of Basic are stored.

Secondly, the description of |*Rompeek* has a mistake – Rom should be 0 to examine the lower Rom.

On a general note, I think it would be better to print the data for machine code programs in hex rather than decimal. 205 90 187 is totally incomprehensible, but CD 5A BB is instantly te cognisable (to Amstrad buffs at least) as the call to print a character.

Ewen Flint, Dumfries

continued on page 10 ▶

Can't Fool an Amsdos

Your reply in Peek and Poke, September 4 concerning loading *Com* files under AMSDOS unfortunately doesn't work. No amount of renaming will fool AMSDOS because it creates headers for each file containing all the information about file name, type, length, etc.

I have had this problem myself as I wanted to use *Devpac* to disassemble *Com* files.

The solution is first to create a dummy file under AMSDOS with

SAVE "TEST BIN" b &2000 length

where length is the size of the *Com* file you wish to transfer. Next boot CP/M and use *DDT* to load the dummy file with

DDT TEST BIN

Examine the header with *d100* now if you wish. An interesting point is that if you have renamed the file the header still contains the original name.

Next overlay your *Com* file using *DDT* with

ITEST COM and R80

80h being the offset required so as not to overwrite the header. Exit *DDT* with *g0* and save the final version of *Test* with

SAVE length in pages TEST.BIN

The length in pages is the original *Com* file length plus *80h*, the header length, all divided by 256. AMSDOS will now recognise your CP/M *Com* file. It sounds a bit involved but works fine. If anyone knows a better way I would like to know.

Alex Aird
Birmingham

Puzzle

Puzzle No 226

There are three boxes on a shelf just about in reach. You cannot look inside, but you can remove the coloured balls contained therein.

On each box is a label but unfortunately the labels have got mixed up and are on the wrong boxes. Inside each box are two balls in the correct combination ie red/red, white/white, red/white.

The object is to determine the minimum number of balls to remove from the boxes in order to discover which balls are in which box.

Solution to Puzzle No 221

Answer

The final arrangement of coins is

H	T	H	T	H	T	H	T
H	H	T	H	T	H	T	T
H	H	H	T	H	T	T	T
H	H	H	H	T	T	T	T
H	H	H	H	T	T	T	T
H	H	H	T	H	T	T	T
H	H	T	H	T	H	T	T
H	T	H	T	H	T	H	T

Solution

The solution utilises a two dimensional array N (N,N) to represent the chess board. Each value in the array is originally set to 1. This represents a coin with heads uppermost. Using conventional X and Y axis each square is taken in the order described in the puzzle.

Lines 70 to 340 turn all coins in line either horizontally, vertically or diagonally. This is exactly the same as the squares attacked by the queen in chess. The coins are turned by multiplying the value in that unit of the array by minus 1, thus +1 becomes –1 and –1 becomes +1. Line 60 turns the coin on which the queen stands only if it is heads uppermost.

Finally lines 1000 to 1030 print out the final array plus 1 indicating heads, minus 1 indicating tails.

Winner of Puzzle No 221

The winner this week is M J Fecher of Maidenhead, Berks who will be receiving £10.

Rules

The closing date for Puzzle No 266 is October 13.

```
10 N=8
20 DIM N(N,N)
30 FOR X=1 TO N:FOR Y=1 TO N
40 N(X,Y)=1:NEXT:NEXT
50 FOR Y=1 TO N:FOR X=1 TO N
60 IF N(X,Y)=1 THEN N(X,Y)=N(X,Y)*-1
70 X1=X:Y1=Y
80 X1=X1-1
90 IF X1<>0 THEN N(X1,Y1)=N(X1,Y1)*-1:GOTO 80
100 X1=X:Y1=Y
110 X1=X1+1
120 IF X1<>N+1 THEN N(X1,Y1)=N(X1,Y1)*-1:GOTO 110
130 X1=X:Y1=Y
140 Y1=Y1-1
150 IF Y1<>0 THEN N(X1,Y1)=N(X1,Y1)*-1:GOTO 140
160 X1=X:Y1=Y
170 Y1=Y1+1
180 IF Y1<>N+1 THEN N(X1,Y1)=N(X1,Y1)*-1:GOTO 170
190 X1=X:Y1=Y
200 X1=X1+1:Y1=Y1+1
210 IF X1=N+1 OR Y1=N+1 THEN 230
220 N(X1,Y1)=N(X1,Y1)*-1:GOTO 200
230 X1=X:Y1=Y
240 X1=X1+1:Y1=Y1-1
250 IF X1=N+1 OR Y1=0 THEN 270
260 N(X1,Y1)=N(X1,Y1)*-1:GOTO 240
270 X1=X:Y1=Y
280 X1=X1-1:Y1=Y1+1
290 IF X1=0 OR Y1=N+1 THEN 310
300 N(X1,Y1)=N(X1,Y1)*-1:GOTO 280
310 X1=X:Y1=Y
320 X1=X1-1:Y1=Y1-1
330 IF X1=0 OR Y1=0 THEN 350
340 N(X1,Y1)=N(X1,Y1)*-1:GOTO 320
350 NEXT X
360 NEXT Y
1000 CLS:FOR Y=1 TO N:FOR X=1 TO N
1010 IF N(X,Y)=1 THEN PRINT;"H";
1020 IF N(X,Y)=-1 THEN PRINT;"T";
1030 NEXT X:PRINT:NEXT Y
```




MIRRORSOFT
ZYTHUM
Unknown perils lurk in the search for the elixir of Zythum.
Can you outwit them and claim the secret of eternal life?
Out now on
SPECTRUM £7.95
MIRRORSOFT
Maxwell House,
74 Worship Street,
London EC2A 2EN
Tel 01-377 4644/5
Telex 886048 BPCC G
Fax 01-377 0022

Letters

Eiderdown price list

I am writing concerning a serious misprint in the *PCW* show report in *Popular Computing Weekly*, September 11 The misprint concerns our software titles for the Atari ST *ST Karate Space Station, ST Protector Fireblaster* and *War Zone*

The programs were criticised as being a little on the expensive side I agree The reporter gave incorrect prices! *Space Station* and *Karate* are £24 95 (not £29 95), while the others are only £19 95 each (not £24 95)

Reference is also made to an unknown game with rather colourful graphics, but small sprites This game, *Haunted House*, is part of our super demo disc, which includes this game, a slide show and some desktops

What's more it's absolutely free of charge (save the cost of the disc) and can be obtained either by sending a disc to us with an S A E or from most Atari dealers Readers may like to know that the games can be recognised in the shops by their distinctive triangular packaging

Eidersoft Software

Beginners be warned!

A warning to beginners like myself! It was not until I saw my letter in (*Popular*, 28 August) headed *DirEdit debugged* that I realised that my recently bought printer CP 80 Type 1, prints out lowercase *g* very similar to lowercase *q* Thus it was no fault of your typesetters that my reference to line 140 was printed to include *qa$(16) qb$(16)* In other words (and trying to type with my fingers crossed), this portion should have read *ga$(16) gb$(16)*

By way of atonement, here is a little tip for program listers when you finish typing a stage use line one *Remmed* to record your last line number When you recommence, load and *List 1* to find your starting place If you update the number at the end of each period it will keep the lead in your pencil!

Joseph G Berry
Northants

A new command

With regard to Simon Goodwin's RSX program 32 new commands for the Amstrad CPCs, *Popular* September 4 – he deserves top marks

However I found a small mistake with one of the commands The command *RScreen* should be *RScroll* – this is given in the *Help* command

Also here's a little addition to save space and loading time

Replace line 50 in the main program with

```
50 SAVE  XEN BIN ,b 41000 1445
```

Then to load, just

```
MEMORY 40999
LOAD   XEN BIN   41000 CALL
41000
```

Kim Foskett
Market Harborough

Questions . . .

With reference to the article on pages 12 to 13 of *Popular Computing Weekly* 11–17 September 1986 that explained how to expand the Amstrad DMP-2000's buffer to 8K The article mentioned that a suitable 8K Ram chip could be obtained from RS (ref 301–870), but did not give an address for this company I would be grateful if you would publish the address

One further point, on my printer the three pads marked J3 have a link wire going from the middle pad to the right hand pad on the top of the circuit board (looking at the board in the same orientation as in figure 2 in the article) and not as stated in the article a PCB track on the underside Hence it is necessary to cut or remove this link wire and then to connect the left hand pad to the middle pad This may be of help to those readers with particular interest in this article who may be experiencing some confusion over this point

A Fisher
Prestwick Ayrshire

The Ram chip in question (see letter below) is the 6264. RS (Radio Spares) can be contacted at Lammas Road, Weldon Industrial Estate, Corby, Northants NN17 5RS (0536 201201).

And answers . . .

Having read with interest the article on the expansion of the Amstrad DMP2000 printer buffer. *Popular* September 11 I have the following comments to make I have been doing this modification to the printer for some time now and I am afraid that Mr Race has a lot of his facts wrong The most important thing that I think readers should know is that just by taking the case off the printer and removing the chip, will invalidate the Amstrad warranty However, this is not the most important part of the problem

Point number one The 8K Ram chip to use is not a 6164 but a 6264 and it is a 28 pin chip, which can be purchased from any good electronics store for less than £3

Point number two There is no need for the PCB to be removed from the casing as the link J3 should have a removable top which when taken off can be changed to the other side ie like in the drawing but without the need of any tools except a small pair of pliers

I hope that this will clear up a few of the problems that might occur when people without too much electrical knowledge try to use a soldering iron I might add that this modification to the DMP2000 is a very simple job for anyone to tackle It seems to me that it was the intention of Amstrad to put an 8K Buffer in but changed their minds at the last minute

I hope that this has cleared up one or two points on this matter

J B Palmer
Warblington
Havant

Dave Race replies: Indeed the 6264 CMOS 8K by 8-bit Ram chip is the one you want. My own DMP printer's J3 link does not have a removable top, but I can well believe that some models do

To put it in black and white

May I clarify the situation regarding the "monochrome" option for the Amstrad PC1512 In common with the CPC464 the PC1512 is fundamentally a *colour* computer, the "monochrome" monitor converting each individual colour to a different shade of grey

Thus the assertion by John Lettice in *Popular*, September 18, that PC games will not run on a monochrome Amstrad PC is incorrect I suspect he is confusing our "monochrome" implementation with the IBM/Hercules monochrome standard (which you can of course fit with a suitable monitor, in one of our expansion slots)

As suggested in his review on page 15 games software houses are converting their games to use the Amstrad 16 colour standard and mouse At the *PCW* show we have already demonstrated *Cyrus Chess* and *Alex Higgins Snooker*, both of which use the Amstrad 16 colour mode and mouse (and are available from Amsoft)

R Perry
Technical Manager
Amstrad Consumer Electronics

John Lettice replies: Mr Perry is quite correct, and my apparent assertion that "if you have a monochrome monitor none of the games will run" is actually a load of old codswallop The text as published didn't, however, reflect what I originally wrote My point initially was that you can't buy a bottom of the range, non-Amstrad PC compatible with mono monitor and expect games software to run, because they don't in general have a graphics adaptor The Amstrad, as Mr Perry so lucidly points out, doesn't have this problem.

Atari versus Amstrad

John Lettice talks to Atari president Sam Tramiel about the newest Atari computers

If the recent *PCW* show proved anything it was that the micro market is diverging into two main strands.

Amstrad launched its PC in the week of the show, and the machine, although an excellent implementation of the IBM standard, is in no means new. Like Amstrad's other micros it is essentially a well-executed package of tried and tested products, and technically breaks no new ground.

The other strand is currently represented by Atari, which although clearly out-ballyhooed by Amstrad at the show, was extolling the virtues of high tech and deploring the vices of packaging to everyone who'd listen.

There's generally at least one Tramiel holding court to the press at each major show, and this time, although Jack was absent, sons Sam and Leonard were filling the slot admirably. In the company's home US market Amstrad hasn't made an impact, and won't do until it launches its PC there next spring, so it's curious that Atari president Sam Tramiel already talks of the British company as a major competitor.

The US is currently pretty well overrun with cheap PC clones, and although 68000-based machines like the ST, Macintosh and Amiga have managed to carve out a niche for themselves, they've in no sense achieved mass market status.

Considering the conditions it would seem logical for companies like Atari to batten down the hatches and wait for the PC storm to blow over.

Sam Tramiel, however, doesn't accept this, seeing the PC standard as something Atari should be in head-on competition with. Asked how he'll do this he waves his hand airily towards the corner of the room. "With that," he says.

The "that" in question was, at the time of the *PCW* show, a mock-up of a new PC-style package of system unit, detached keyboard and monitor based on the ST. According to Tramiel the machine is already in prototype form, and will be launched directly against Amstrad and the clones.

> ***"The Atari ST will be available in a new housing, so you'll either get it as a complete package or à la carte"***
>
> **– Sam Tramiel on the new Atari machines**

"It'll mean the ST will be also available in a new housing, so you'll get it either as a complete package, or *à la carte*." The mock up bore the legend "2080ST", but Atari isn't saying what it will eventually be called.

Tramiel claimed to be unsure whether the base machine will have 2Mb or 4Mb of Ram as standard, but it seems likely that first models will be 68000-based, with 68020 versions to follow.

Pressed on price, Tramiel first says it will be priced "competitively", then elaborates:

"There's no reason for it to be priced under Amstrad, it will be either the same price or slightly over," the argument being that the ST is vastly superior to the PC technically, and can therefore sustain some price disadvantage.

But if it's to compete with Amstrad on price Atari has a problem. Amstrad now has an entry level, single drive machine with bundled mono monitor for £459, and even if Atari were to produce a bundled version of the 520ST to compete here – which clearly wasn't what Tramiel was talking about – it would have to drop the machine's price by around £100, with similar implications for the rest of the range.

Launch date is also equivocal, as Tramiel would clearly like to get the new version STs out this November, while general manager Max Bambridge guarantees "no more new machines before Hanover" (next year's Hanover Fair), then undercuts himself by saying that because the micro market changes so fast that statement only holds good for two weeks.

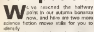
Bambridge also categorically denies that Atari will be launching a £459 Amstrad-basher, and changes the subject when it's suggested Atari might currently be split over whether to go for Amstrad or not.

As far as Sam Tramiel is concerned, it's more a case of "how" than "whether".

Clearly he wants the ST to supplant the PC as a world standard, and clearly he wants to begin to make this happen, but he's still looking at market conditions – British market conditions in particular. The question – which he's not too proud to ask people – is whether the ST can compete on a combination of power and price, or whether it can only face Amstrad by competing on price.

If the answer is price, then the next question Atari must ask itself is whether it can afford it. If it decides it can we might just see some interesting new launches a lot earlier than Hanover.

Have you entered our Autumn Competition?



We've reached the halfway point in our autumn bonanza now, and here are two more science fiction movie stills for you to identify

Remember — don't send anything in yet There are two more films to be identified next week and after that, we'll print the entry form and maybe drop a hint or two

The prizes

Up for grabs are some pretty classy prizes Five brand new Spectrum Plus 2s will go to the first five winners then we've got ten Star Macronix printers to give to the next winners And last but not least the next 50 winners will receive a Mastertronic Magnum joystick So don't lose this page – with prizes like these on offer you can't afford not to enter



Picture 5 (above): Which film featured these weirdos?

Picture 6 (left): Not so difficult perhaps, but which movie in the series does this still come from?



LOGIC'S SUMMER SALE
SPECTRUM TITLES
Sold a Million
Arcade Hall of Fame
PERIPHERALS 48K
COMMODORE 64 TITLES
COMM 64 DISCS
64 UTILITIES
Bargain Books from 1st Publishing
1st Publishing Programs on Disc for C64
Postage and packing
75p all orders
OVERSEAS
£1.00 per tape
LOGIC SALES LTD,
6 MIDGATE, PETERBOROUGH,
CAMBS PE1 1TN
24 hour ordering on 0733 313870
ANCIENT & MODERN
YOUR NAME
IN THIS
SPACE!
CALL SIMON LANGSTON
01-437 4343
Once Bytten
31 BOWNESS ROAD
LONDON SE6 2DG
Phone Orders. 01-696 2911
(Callers by Appointment Only)
IT'S THE WAY WE SELL 'EM!
THAT MAKES ONCE BYTTEN DISC THE BEST BUY. TOP
QUALITY FLOPPIES FROM TOP FLIGHT MANUFACTURERS
100% ERROR FREE – LIFETIME GUARANTEE AND NO HIDDEN
EXTRAS ... WHAT YOU SEE IS WHAT YOU PAY
SPECIAL OFFERS FOR AUTUMNAL EVENINGS IN FRONT OF YOUR MICRO!!!
Bulk Unbranded Discs with sleeves
DISC BOXES
5¼" 10 Capacity 1 + £1 50 10 + £1 25
5¼" 100 Capacity Locking 11 + £11 95
12 + £10 00
EXTRA ENVELOPES 5¼"
LABELS
5¼" Label Sets (for 10 discs)
inc write-protects 1 + 35p 20 + 25p
3½" Label Sets (for 10 discs)
1 + 25p 20 + 20p
IMPORTANT NOTE — Any order including 10 or more discs is POST FREE, otherwise please add £1 00
ALPHACOM 32 PRINTERS
High quality thermal printer for all Spectrums at a give-away price
only £19.95
(p&p insurance £3 00)

The basic alternative for the ST

A new Basic is something that the ST is in need of. On paper there's nothing actually wrong with *ST Basic*, but a combination of bugs, the random destruction of the contents of string variables probably being the worst, and the awful editor makes programming a nigh on impossible chore.

So if you can't be bothered waiting for Atari to replace it sometime in the distant future and you want to do some programming then an alternative is worth considering.

Fast ST Basic is one such alternative from Computer Concepts, well known for their BBC software. Indeed, there is a certain BBC Basic flavour to some of the commands available. Not only that, but a number of word processing features have been included as well.

If you're going to call a product *Fast ST Basic* then to retain credibility it should knock along at decent pace. In fact it does more than that, it positively flies. Below are the results when the Basic undertook the PCW bench tests, beating everything in sight from all eight bit machines (including the Amstrad PC alone) to 68000 based computers like the QL and Macintosh.

Benchtest No.	Speed (seconds)
1	0 145
2	0 58
3	1 305
4	1 455
5	1 51
6	2 58
7	4 105
8	2 73
Average	1 801 seconds

The first thing to note about *Fast ST Basic* is that unlike the official language, it is supplied on a 128k cartridge which takes up no user memory. After a couple of clicks on the relevant icons, the two main windows of Fast Basic appear almost instantaneously.

These are the edit and output windows. All program output is shown in the output window, naturally, but using some of the available commands it's quite easy to print outside it, anywhere on the screen in fact.

The edit window allows the inputing of program lines as well as correcting and editing facilities. Amongst the editing options are the facilities to cut, copy, paste and clear chunks of a program listing. The word processing theme continues with a search and replace feature and the fact that you can have ten different programs in memory (in segments which are allocated 32k when something is put into them) at the same time, although they won't run concurrently.

The other window available is the immediate window which is basically used for testing what a particular command will do without having to run a program.

Students of structured programming will be well pleased, because as well as offering *Def Proc ... Endproc, Repeat ... Until, If ... Then ... Else, Endif*, and *While ... Wend* constructs, line numbers are completely optional in the program. If used, line numbers are simply utilised as labels and so are not automatically sorted as in other Basics. A program numbered 20, 30, 10, 5 will run in exactly that order, not the usual numerical order.

The ST is renowned for its quality graphics so it's nice to see 64 graphics related commands. It's possible to set the various patterns and colours used by the commands that draw lines, circles, pie charts, arcs, elliptical versions of the preceding commands, boxes, polygons, rectangles with rounded edges, fills and plot points.

A useful feature is the ability to print text, in various styles, at any graphics location on the screen, providing that the location is inside the user defined graphics area (which can be outside the output window!). Once there, text can be scrolled in any direction for any distance, one pixel at a time, and believe me, it does it very quickly, with just one command. Text can also be justified on a pixel rather than character square basis.

A famous smile for fast ST Basic

Most impressive of all is the *Blit* command, a software blitter. Once an area of the screen has been defined, it can be moved around at will, although with nine parameters required it's certainly no doddle.

With the *Palette* command available, any of the ST's 512 possible colours can be displayed, something else that ST Basic could not manage to do.

An interesting pseudo variable is *Physbase* which can be read or written and determines which part of memory is used as the screen display. So, various picture screens could be loaded in and then displayed instantly by changing the value of *Physbase* to point to them. *Logbase* is a related pseudo variable which points to where in memory all screen output will end up. So, it's quite feasible to set an entirely new display area, free from the constraints of the output window, the size of which cannot be defined from within a program anyway.

File handling, serial and random access, is covered fairly comprehensively, the commands allowing the creation of directories and files and the reading and writing of characters or blocks of characters within them.

Perhaps the most staggering advantage of *Fast ST Basic* over the official lingo concerns using the various facilities offered by GEM. Atari *ST Basic* has such no commands, whereas *Fast ST Basic* is incredibly comprehensive, providing the means to do virtually anything. Mouse control, drop-down menus, dialogue and alert boxes, windows and the like are all available. However, it has to be said that for the more advanced commands a thorough knowledge of the subject is required before attempting to use them.

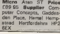
And finally, there is an assembler built-in which enables Basic and assembly language commands to be used together in BBC micro style. Unfortunately there are only a scant 11 pages of the manual devoted to the assembler which can hardly be said to be enough.

Fast ST Basic is not perfect: program lines can be larger than the edit window causing the left hand side of the line to vanish as window scrolls everything along (it means you can't see all of the program line at once). There's no command to change screen mode and the sound commands are few (three) and somewhat crude.

One other problem – the manual is inadequate in places, there again how could it hope to cover everything in detail without being so large as to add pounds to the selling price of the whole package?

But any way you look at the thing, it's a vast improvement on Atari ST Basic in virtually all departments, very fast and definitely worth considering.

Duncan Evans


Program *Fast ST Basic* **Micro** Atari ST **Price** £89 95 **Supplier** Computer Concepts, Gaddesden Place, Hemel Hempstead, Hertfordshire HP2 6EX

Exploring the cave of the Word Wizard

Educational software has very seldom been 100% satisfactory Enher it is very good educationally but poorly programmed, lacking motivation and ease of use, or very well programmed but totally useless as far as teaching is concerned

A new product from Timeworks UK the distributors of various business software, for the C128 bnngs a fresh approach to educational software, with *Cave of the Word Wizard* a spelling game with a built in speech facility

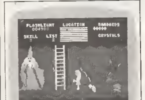
The program comes on a disc where Side a contains the main program, and Side b contains additional word libranes The game is similar in play to *Impossible Mission* you are in the Wizard s Cave, and you must find four crystals to escape

There are eight levels in the cave (which are reached via ladders and holes) and of course there are nasties, namely rocks spiders puddles which will require a plaster when bumped into

As you proceed with your quest, the batteries of your torch weaken, and the wizard appears at regular intervals to ask the spelling of a word It is fair to say that the speech is excellent the only snag being a hint of American accent If you spell the spoken word correctly, you are rewarded with extra batteries or plasters, otherwise you lose some light You lose if you run out of light or have encountered too many nasties

The whole thing is very well presented and is a lot of fun to play even for a grown-up with several libranes of words that should take care of the more advanced player A nice touch is the facility to choose between being a little boy or a little girl

"The whole thing is very well presented, and is a lot of fun to play even for a grown-up, with severel libraries of words to take care of the advanced player"



From the *Cave of the Word Wizard*

The acid test came when young children played the game The results speak for themselves children will play it for hours I would definitely class this game as one of the best educational programs ever published

Eric Deghaye

Program *Cave of the Word Wizard* **Micro** Commodore 64/128 **Price** £19 95 (disc only) **Supplier** Timeworks UK, PO Box 453, Maidenhead, Berks SL6 1ST

The Rolls-Royce of merger programs

No matter how good the hardware, or the operating system, or the programming language, no manufacturer has yet released the perfect programming system

Which is good news for hackers who like to write their own utilities And better news for software companies who like to sell utilities to those of us not up to writing our own

Companies like Indev, which has recently released *Blinker* for the Commodore 64

Blinker is a Basic linker, somewhat like the merge utilities often included in programmer s toolkits, or printed in magazines like *Popular*

However *Blinker* is to merge utilities what a Rolls-Royce is to a Citroen 2CV

What *Blinker* does is to allow you to create libraries of oft used routines, and incorporate them into new programs with consummate ease More to the point, it s a rock-solid piece of software which tells you what s happening as it happens, what's just happened, whether anything went wrong and what the state of play is after it s done all these things

Error messages are clear and helpful and the documentation is excellent with full examples memory maps and so on

Suppose you want to write a simple database (or even a complicated one) Break it down into a number of routines, add a record find a record, delete a record, sort a file load a file, save a file etc

Now, clever chap that you are you already have a sort routine, and save load and print routines, and all sorts of other useful stuff

Instead of writing it all over again, you simply load *Blinker*, write the master routine to control all the other bits then type in BLINK "SORT", "SAVE", "LOAD" "PRINT", etc

Now *Blinker* will pull in all these routines from disc, tag them onto the end of your main module renumber everything, and leave the whole job neat and tidy

It also tells you how much program memory is being consumed, how much variable memory is available, and will intelligently look for routines that would create an *"Out of Memory"* error, or illegal line numbers

There are lots of other possibilities too, but what it boils down to is that *Blinker* makes serious program writing a hell of a lot easier

And there s the rub, as Shakespeare would put it Who does that much serious programming in 64 Basic? There s also the question of price *Blinker* will cost you £29 90, which to my mind is precisely £14 95 too much

So, wonderful as *Blinker* undoubtedly is, I don't see much of a market for it Pity really, but then I almost never use the Rolls to drop off the laundry either

Peter Worlock

Program *Blinker-64* **Micro** Commodore 64 with disc drive **Price** £29 90 **Supplier** Indev, 24 Deerings Road, Reigate, Surrey RH2 0PN

The clone of contention

The new Amstrad machine, says John Lettice, is up and running

Amstrad has traditionally made larger and larger piles of money not by stating the obvious so much as by doing it Obviously there was big money to be made in the home computer market, so the CPC464 was launched Obviously serious users wanted a complete system that they could use rather than puzzle over, hence the PCW8256 and 8512

The latest move, the launch of the PC1512 series, is probably the most obvious of the lot IBM has dominated the business market for the last five years and has sold stacks and stacks of its PCs simply by virtue of the fact that it is IBM Other business manufacturers have followed the IBM standard and until recently, when a lot of small companies decided they could put together IBM clones sell them for half the price of an IBM PC, and still make a profit the bigger companies were all doing very well for themselves

Now the obvious bit here is that it needn t actually cost any more to produce a business machine than it does to make any other machine and that if a company were to produce a PC clone in volume it could sell it at a price low enough to make the business manufacturers lose interest in the PC standard fairly rapidly That s what Amstrad has done with its PC, and the initial intention is to carve out a large slice of the world market On first impressions the new machines might just be neat enough and cheap enough to do it

> **"The monitor is neatly designed and mounted on a tilt and swivel stand on the top plate"**

The machine is simple in construction It s smaller and lighter than the IBM PC, but the need for 5½ inch disc drives and IBM standard expansion slots has kept its desktop footprint up to around 15 × 15 inches

The entry-level machine has a single drive plus monochrome monitor, and the series goes up to single drive plus 20Mb hard disc and colour monitor The review machine s twin floppy drives took up the whole of the front plate of the machine and being substantial metal sheathed beasts extended back across half of the machine s base unit

I/O ports are on the left hand side and around the back On the left beside the volume control (zero to horrible racket) is the keyboard plug and mouse port I take it the latter s placing was dictated by circuit board layout, but while I m happy to meet my first left handed mouse I m not sure how the majority of users who are I believe right handed, will take to it

Parallel and serial ports are at the rear with video output and power input (like other Amstrad machines the power supply goes through the monitor) just along from them

On most PC compatibles the expansion slots are accessed by unscrewing the casing, generally a fiddly task on a crowded desk but the Amstrad PC uses a hatch to the rear of the top of the casing plus one on the side for access to

continued on page 18 ▶

the cards' interfaces. Both these are easily snapped in and out.

The monitor is again neatly designed, and is mounted on a tilt and swivel stand that fits into a well on the top plate. Unlike standard IBMs the monochrome and colour versions use the same video output, with the mono simply showing shades of grey instead of colour.

IBMs also have severe limitations on the number of colours that can be displayed at once – which is why PC games generally have odd colour combinations – but the Amstrad can handle 16 in 80 column mode. It's also compatible with two of the modes available on IBM's EGA (Enhanced Graphics Adaptor), which is more than you can say for most software packages.

Screen quality is quite good, although not superb, and this leads on to a major disadvantage. Because the power supply is in the monitor you can't fit third party monitors to the machine without fitting a new power supply or running two monitors. You'd also better be sure of the monitor you want when you buy the machine, because if you upgrade from Amstrad mono to Amstrad colour you'll wind up with a useless mono monitor.

The machine's keyboard is basically IBM format, although there's a separate *Enter* key on the numeric keypad (operation being similar to the one on the PCW), and the *Alt, Control, Caps lock* and *PrtSc* (print screen) keys have been moved to slightly more sensible locations.

The feel of the keys is fine, although I've seen better on machines four or five times the price of the Amstrads. The keyboard also includes a joystick socket, but this apparently emulates the cursor keys rather than being compatible with the standard IBM joystick, so games software will need some amendment.

If you look inside the machine you see what Amstrad really does best. The original IBM machines have sprawling circuit boards populated by large quantities of low-tech chips. The Amstrad on the other hand has its chip set boiled right down, and rather than being socketed (which is cheaper for small runs, but costs more for volume production) most of the chips are surface mounted.

The board takes up around two thirds of the machine's base. The 512K Ram is made up of 256K chips, while the 128K upgrade will consist of 64K chips fitted into sockets alongside. These extend right under drive A, which would have to be removed to gain access to them. What price field upgrades?

The 8086 processor is fairly central, with a socket for the 8087 maths coprocessor alongside it, other major points of interest being several custom chips labelled Amstrad. Developing these will have a cost a packet, but when economies of scale take over they'll make Amstrad's production costs difficult to match.

Operation

Amstrad claims that the machine is spectacularly fast, outrunning all but the Pinnacle, a little-known PC compatible machine. The claims are true, as far as running Basic programs are concerned, but don't really hold water for normal operation. Disc access for a standard *Wordstar* document is marginally faster on the Amstrad than the Bondwell PC, but then again as the Amstrad has the superior 8086 chip running at 8MHz, and the Bondwell has an 8088 running at 4·7MHz, it ought to be a lot faster. The point here is that the basic mechanics of I/O flatten out performance considerably.

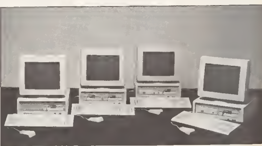
Screen handling is also an impediment to the Amstrad's speed. As far as text display is concerned it's faster than the IBM, but seems lower than the Olivetti M24, which also runs an 8086 at 8MHz. Graphic screens are more significantly slower. The test used here, which I hereby patent, involves *F15 Strike Eagle* software (see last week's issue for review) and time taken to run out of fuel. With afterburners engaged the Amstrad took just under three minutes, while the Olivetti turned into a brick at just over two.

The Amstrad, however, is probably still faster than the IBM in terms of graphics. The spectacular differences in Basic speeds (over twice the speed of the M24) can incidentally be ascribed in part to Locomotive's Basic 2, which is very fast indeed. It also runs under Gem, and together Gem and Basic 2 suck up over 470K of the machine's 512K Ram, but that's another story.

System software

This is probably the most valuable, and unnerving, area of the whole machine. The standard IBM operating system is Microsoft's MSDOS, and this is included. It is, however, also possible to use the machine with a second system, Digital Research's Dos Plus, which is also bundled, and finally it can be run under Gem, DR's windowing front end for the PC. Gem isn't strictly an operating system but has been pre-installed on a third disc which also includes Dos Plus.

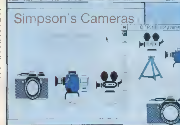
Working out which you'll use is problem enough, but the confusion is heightened by various bits and pieces that



squirt out of the discs as you chug along

Dos Plus allows a measure of multi-tasking, and the disc includes a couple of little programs, including an alarm and background printing utility, that take advantage of this. These, however, can only be accessed through Dos Plus, not through MSDOS or Gem. Considering DR wrote both Dos Plus and Gem I'm sure there must be a way to put the two together, but initial phone calls didn't enlighten me.

Dos Plus and Gem in fact, although worthwhile independently, don't seem to add up to more than the sum of their parts. Exit to Dos from Gem and you can't get back to Gem Desktop. Instead you've got to put the Gem Startup disc back into A, type *autoexec* or *gem* (although the latter appears not to work if you've run a program in the meantime) then reload the Desktop disc. It seems to me that DR ought to be able to make the two systems a lot more integrated than this.



Compatibility

The way to make a machine totally compatible is to make it as slow and horrible as the original IBM. Amstrad to its credit hasn't done this, but the machine is still almost 100 per cent compatible. *Lotus 1-2-3*, *dBase*, *Flight Simulator* and *Open Access* all run, and I had no trouble with a fairly wide range of other programs, apart from *Sargon 3* chess, which seemed reluctant to return to a text screen after going to a graphics display. The latter also, however, gives trouble on the Olivetti, where it crashes whenever it seems to be losing.

Hardware compatibility is more difficult to judge, but the machine is likely to be able to take most IBM expansion cards with a few exceptions.

It won't take an EGA because it can't patch out its own graphics, and extra serial and parallel cards may cause problems depending on which areas of memory they use. The advice here is try before you buy.

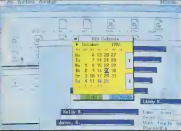
Verdict

There are a few disadvantages to the Amstrad machines in absolute terms, but as a total package of software and hardware they're well up in the front runners among PC clones. Take price into account and they have no competition there. Their competition elsewhere really depends on what you want a machine for.

If you want a fast, non-compromise machine at the cutting edge of technology you'd probably look elsewhere, but the Amstrads make no pretence to being this kind of machine.

What they are is cheap, relatively fast machines that run more different software packages than any other micro. At the moment this software is mainly business, but as the support market goes crazy it's inevitable that software of all kinds will be launched for the PC.

So the message is, if you want it for business it's a good buy now (although bear in mind you'll have to buy extra applications software and a printer) while if you are an enthusiast it may be worth your while waiting until the support starts coming through. Either way, at the price it's hard to go wrong.



All three photos above: the uses of a rare Gem

Machine Amstrad PC1512 **Supplier** Amstrad, Brentwood House, 169 King's Road, Brentwood, Essex CM14 4EF

Prices (all including VAT)
512K machine plus

Single 360K drive and mono monitor	£469
Single drive and colour monitor	£649
Twin drives and mono monitor	£587
Twin drives and colour monitor	£764
Single drive, 10Mb hard disc, mono	£822
Single drive, 10Mb hard disc, colour	£999
Single drive, 20Mb hard disc, mono	£940
Single drive, 20Mb hard disc, colour	£1,116

Computer cartoons for the younger generation



Camp Totorum from Asterix

Asterix is the most successful attempt yet to create a cartoon-style computer game. The graphics are faithful to the spirit of the popular Asterix comic books, and the action is a combination of arcade challenge and simple entertainment.

Asterix, hero of the last Gaulish village still resisting the Roman invaders, must search the countryside for the missing pieces of the Magic Cauldron.

Without these, the village wise man Getafix cannot brew the magic potion which gives Asterix his irresistible strength.

Asterix and his giant companion Obelix move through some nicely coloured landscapes of trees, villages, Roman forts and deep forests in search of the lost pot.

Movement is three dimensional and is controlled by joystick, and icons display your position, supplies, amount of magic potion available and so on.

Obelix needs a constant supply of hams, so Asterix must battle wild boar and there are always Roman legionaries must also be fought.

Battles take place in a blown up section of screen in which the opponents slug it out with punches and kicks, again under joystick control, in a sort of mini-Exploding Fist scenario.

The music is nice, the graphics are fun, and the game must be quite difficult (since I couldn't get very far with it). However, the scenery takes an annoyingly long time to draw every time Asterix and chums wander from one scene to another and this along with the lack of complex challenges will probably mean that *Asterix* will appeal more to younger players.

Popular Appeal ♦ ♦ ♦ ♦

Chris Jenkins

Program *Asterix* **Micro** CBM 64 **Price** £9.95 **Supplier** Melbourne House, High Street, Hampton Wick, Kingston Upon Thames

BMX Simulator to go platinum

The budget software market with some justification has often been compared to the singles record market – but whether that's true or not, *BMX Simulator* (one of the first releases from the new budget software house Code Masters) possesses many of the virtues a good 45 should have.

It's bright, loud, catchy and it's cheap. In short, everything a budget game should be.

Sequel to that huge seller *BMX Racers*, this one is an overhead view of various BMX tracks (seven in all) which you race around, challenging either a friend or the computer.



You manouevre your bike round the track using joystick or keyboard. The controls are a doddle – left/right, pressing fire to accelerate, finger off the fire button to brake.

The tracks start off fairly simple with quite a generous time limit, but get much more difficult as time goes on. You soon find yourself having to use the banked corners to get that extra speed.

The actual sound effect produced as you crank the pedals is a bit peculiar – a cross between a steam engine and someone clapping slowly in the middle of the Albert Hall, but the finger clicking music between races makes up for that.

Great fun, especially as a two player game. I'd say it'll go platinum.

Popular Appeal ♦ ♦ ♦ ♦

John Cook

Program *BMX Simulator* **Micro** Commodore 64 **Price** £1.99 **Supplier** Code Masters

The much too silent service

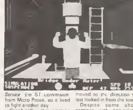
Ping! Ping! The sonar gave its monotonous warning of the destroyers relentless advance overhead on a nauseatingly clear afternoon in 1944

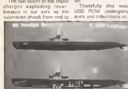
The chase had lasted three hours, had seen our deck gun blown to pieces bow torpedo tubes exhausted, engines and hull damaged Speaking of the hull that creaked ominously as we hovered perilously close to our maximum test depth

The dull boom of the depth charges exploding reverberated in our ears as the submarine shook from end to end from the shock waves With a tortured howl rivets flew from stanchions and plates buckled and collapsed beneath the awful pressure of being 400 feet underneath the Pacific Time to surface Blowing the emergency tanks, we clawed our way upwards

Unfortunately the cruiser was waiting and no sooner had the conning tower emerged sparkling into the sunlight than it was blown off

Thankfully this was the USS PCW undergoing its trials and tribulations in *Silent Service* the ST conversion from Micro Prose, so it lived to fight another day





One of the silent screens from the silent service

Graphically this version scores over the C64 original, all the screens bar the maps being more detailed, some substantially more The gameplay is exactly the same but this has a couple of extra missions to take your submarine on

All is not perfect though For instance when on the surface it s impossible to quickly scan around and if you try looking around, once you get below decks again you ll find the periscope has moved to the direction you last looked in from the tower

Despite some shortcomings with non existent sound effects (creaks and damage from depth charges) *Silent Service* is a pretty good game even if it s not quite Das Boot

Popular Appeal ♦ ♦ ♦

Duncan Evans

Program *Silent Service* **Micro** Atari ST **Price** £24 95 **Supplier** US Gold Unit 2–3 Holford Way, Holford, Birmingham B6 7AX

Droids and robots, arcade and adventure from Anglosoft for your Commodore

It s always good to see a new games software house emerging, Anglosoft isn t a new name but previous releases have been in the MSX and CBM utilities field

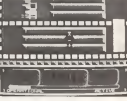
Droids is a nicely-produced arcade adventure with elements of Hewson s *Paradroid* and Epyx's *Impossible Mission* The graphics are big and colourful and the programming is pleasantly fast and smooth

You control a space commando attempting to disable a rogue battlecruiser The screen shows two levels of deck plus your score, lives remaining and energy level Energy pods allow you to replenish lost power

Scattered around the decks are escalators to allow you to change level, hatches to the next deck and terminals to log on to

Guard robots have to be zapped or ducked and once they re all destroyed you can access a terminal enter the correct code and shut down that deck

Teleporters enable you to jump from one deck to another, though it can be a shock to find that the guard robots get more and more vicious on later decks



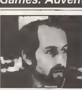
Plans of the deck both side views and top can be called up from the terminals and there s a challenging little reaction test involving moving an indicator through moving barriers in order to shut down each deck

Good fun though not hugely original – worth checking out if you want to encourage a worthy new games software house

Popular Appeal ♦ ♦ ♦

Chris Jenkins

Program *Droids* **Micro** CBM 64 **Price** £8 95 **Supplier** Anglosoft, PO Box 50, Coventry CV1 5SX.



An adventurer's guide to the Hitchhiker's Guide to the Galaxy

The omnipotent Tony Bridge brings you the secret of the Babel fish and more . . .

We looked some weeks ago at the problem of the intelligence screening door in *Hitchhiker's Guide to the Galaxy*, but there is an earlier puzzle that gets everyone tearing their hair out, the getting of the Babel fishl

If you haven't solved this one yet, then you may not know that you need the fish to be able to understand what all that garbage is coming over the intercom (although you will know, if you have consulted the guide, that the Babel fish will allow you to hear any alien language in perfect English)

As you'll know by examining the dispensing machine, there is a source of Babel fish in the vogon hold (by the way just getting to see in the hold is quite a trick – when you first find yourself in this predicament, just input any old rubbish and watch the responses very carefully, particularly counting the number of senses unavailable to you, it's not the only time that this trick works, so keep it in mind for future use)

"Infocom and Douglas Adams are more devious than to allow you a prized object as easily as merely pushing a button! The Babel fish comes out . . . only to disappear from view through a tiny hole in the opposite wall"

Back to the fish, and you'll naturally press the button on the dispensing machine. But Infocom and Douglas Adams are more devious than to allow you a prized object as easily as merely pushing a button! The fish comes out all right but sails across the room at knee level to disappear from view through a tiny hole in the opposite wall Oh dear

But there is a hook just above the hole so maybe you could hang something on this hook, thus covering the hole Ford's towel doesn't unfortunately, want to stay on the hook, so something else must be tried At last the trusty dressing gown will come in handy!

So now the hole is covered up, try again The Babel fish isn't going to give up that easily, however – although it slides down the sleeve of the gown, it then falls to the floor, to disappear through a previously unseen drain You'll find that the towel is quite large enough to cover the drain (you're right, the dressing gown *isn't*)

But but As the fish lies there, a tiny cleaning robot whizzes across the floor and, pausing only to grab the fish disappears through a panel in another wall Is this fish *ever* going to give up?

Applying what we've learnt so far, we can safely assume that this panel can be covered up too What else can we use? How about Ford's satchel? He's asleep now so he won't mind if you prop it against the panel, and this works fine, except that now wouldn't you just know it, a *second* robot zips in to gracefully catch the fish as it bounces off the satchel!

The *Hitchhiker's Guide*

Something else is called for here – if you read that last description about the second robot there's a germ of an idea there Now, you *did* bring the junk mail with you didn't you? I hope so, because that is what we need now – just place it on top of the satchel, press the button one more time, and watch what happens

At last the Babel fish is yours, but what a marvellous problem, and what a marvellous feeling for the adventurer when finally solved This kind of thing is what makes Infocom stand head and shoulders above other software houses Meanwhile, however, don't think that the vogon hold has given up all its secrets

While we're in space, let's take a look at *Rebel Planet* and the peculiar problems that the game from Adventure Soft UK has been posing to players As you may have gathered from my recent Corners, I find this story quite a refreshing program, and promising for the future of this company

Although a lot of exploring may be done at the start the first priority is to get the access card from the galactic travel valet This is accomplished by talking to it, when the card will be revealed along with the analgesic ampoule and two tickets to Troho

You'll know from the blurb on the cassette inlay that you must beware of showing weapons to the police or customs A good way of hiding such things as the laser sword is to use the lite kube Just *Drop* the object *into Kube* and when needed, *Get* object *from Kube* Incidentally, the kube will also allow you to carry more objects at one time than would be possible otherwise

To get through the customs, ensure that all weapons and doubtful objects like the alloy strip etc , are carried in the lite kube Once you meet the officers (which may take some doing, I can tell you!), you'll need the card at least Now you'll come across a pair of angry Arcadians who aren't too impressed that you seem to have parked your stupid spaceship right in their parking space! Giving the ticket to them will get rid of them and will also yield up a nice object for you!

Let's finish with a bit more Infocom help *Wishbringer* is described by the authors as being an adventure for beginners, but as you'd imagine, that doesn't mean that it is in any way a walkover! I haven't got space to go into great detail, but a couple of problems might be giving you a headache if you've just started

First don't bother trying to get the chocolate in the police station Although it is the focus for a spell, you won't actually need that spell during the course of the game Next don't get caught by the boot patrol, or you'll land up in jail – the way to avoid them is to simply run in the opposite direction

You *will* need to get into the jail at a later stage, but this is accomplished by opening the tree stump on Lookout Hill Once in the jail you must get the blanket which you must then to use to keep the grue captive Finally, when in the cinema look under the seat for something spectacular!

Dungeon Adventure on Spectrum. A severe lack of progress. Any help at all would be appreciated. How do I use those zarking collars? Are there any other light sources apart from the resin-burning wood and where are they – please! Simon Amos 22 Albert Road, Tonbridge, Kent TN4 2SR

The Fantastic Four, part one on BBC B. How does the thing pass the fire in the cavern and how does the torch move the boulder? Paul Tang, 21 Main Street, Branston, Burton-on-Trent, Staffs DE14 3EY

Robin of Sherwood on Amstrad CPC 464. I have got one touchstone, but I don't know how to get the others. Gavin Lennon, 10 Earlsvale Road, Cavan, Co Cavan, Eire

Hampstead on Spectrum. How do you get a job? What do you do with the credit card? What do you do with the lathe bracket? Martyn Cheney, 12 Greenock Street Armley, Leeds LS12 3JH

Heroes of Karn on C64 I can't get past the bear. Andrew Lancaster, 16 Anne Close, Christchurch, Dorset BH23 2NW

Sword of the Rings on Spectrum. How do I get the debugger that is used to kill the kremlins? After climbing down the rope how do I get it back? Simon Amos, 22 Albert Road, Tonbridge, Kent TN4 2SR

Crystal Quest on Spectrum. How do I fix the engine malfunction and move the lift on sentinel delta? What next after getting blowpipe? Tony Fox, 15 Spenser Street, Bootle Merseyside L20 4LN (051-933 6652)

Knight Tyme on MSX. How do I get my photo on to the ID card, having got camera, film, glue, etc? Matthew Palmer, 21 Beaumont Close, Maidenhead, Berkshire SL6 3XN

The Hobbit on Spectrum. After carrying Bard to the dragon's sleeping place, what should he do to kill the dragon? How does he kill the dragon with bow and arrow? I would be obliged if anyone can come forward with a solution to this problem. G M Patkar, c/o John Harris Assoc, PO Box 214, Muscat Sultanate of Oman

The Boggit on Spectrum. How do I get out of the tunnel like hall? J Haslam 8 Sittingbourne Avenue Bush Hill Park, Enfield, Middlesex EN1 2Da

Questprobe: Torch/Thing on Spectrum. I can't get thing out of the tar pit, or get into Doctor Doom's castle. Help! Philip May, 73 Fidlas Road, Llanishen, Cardiff S Glamorgan Wales CF4 5LX

Twin Kingdom Valley on Spectrum. How do I kill the witch in the castle of the desert king? Simon Amos 22 Albert Road, Tonbridge Kent TN4 2SR

Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn do not despair – help is at hand

Fill in the coupon, explaining your problem, send it to us, and a fellow adventurer may be able to help

Remember – the system only works if those adventurers who have solved the puzzles get in touch. Every week is Save An Adventurer Today (SAAT) week!

Adventure .... on (Micro) ....
Problem ....
....
Name ....
Address ....
....

Mercenary's Second City – the final solution

Tony Kendle begins the first of a series of articles with maps on solving Novagen's classic



This week we start a special treat for *Mercenary* fans – the complete solution and map to the second city sent in by Christopher Hester, who wrote such an excellent piece on the first game

Second City is notable as being the first data set that ever reached the software charts and it is a testament to the lasting quality of the original game that it was so popular and in no way dated. The forthcoming Amstrad/Spectrum *Mercenary* releases will be the first city but hopefully these games will have provision for the second city releases The awesome ST version will be a compendium of both cities together with a Targ survival kit of maps and hints This compendium will also be ready in 8-bit Atari, Commodore 64 and Plus/4 versions

On with the game Christopher writes

The second city is much harder than the original there are all kinds of traps for you New features include a cheat room, accessible through any triangular door, there's only one problem – no key!

'There are permanently dark rooms which even a photon emitter cannot light up These appear orange

'A lot of rooms appear dark but you could see in them with a photon emitter, but guess what, it's hard to get at the emitter and seemingly impossible to remove it It lies in a room accessible only by a one way transporter room Once in the transporter cannot be used again Are you stuck? The room features two other doors, one of which has a skull and crossbones over it! If you go through that you fall out of the colony craft but fear not, that is what you have to do

'First you need the antigrav which will let you pick up your ship and when you fall to the ground you simply drop it and off you go again

An alternative is to cheat – drop to the ground and drop all your objects Press *Ctrl-Q* to quit and you get a new ship with all objects still nearby

The abundance of darkened rooms means that unlike before you can't avoid them to get through In one of them a key is hidden

Another in the hangar complex 3 04, features six doors each a different shape The following tips have been of help here

In a lit room if you face a wall and turn about twenty degrees to one side then move over to the wall, you can force your way along it until you hit a door which you will go through if it isn't locked After practising you'll find any invisible doors if you do the same in a dark room A wall that has several doors along it is unfortunately a difficult challenge and you are never sure when you have reached the end of the wall so going right round a dark room is tricky

'Not all traps are marked by a skull and crossbones – you just have to try each door to see

There is a room where only the lines of the floor are visible, which is one of the three prisons

More on *Mercenary Second City*, and more maps next week

MERCENARY THE SECOND CITY

1 – ANTIGRAV
2 – ANTI-TIME BOMB
3 – CATERING PROVISIONS
4 – LARGE BOX
5 – USEFUL ARMAMENT
6 – CHEESE (TABLE)
7 – COFFIN
8 – POWERAMP
9 – KEY
10 – KEY
11 – KEY
12 – KEY
13 – KEY
14 – KEY
15 – MECHANOID
16 – WINCHESTER
17 – PASS
18 – MEDICAL SUPPLIES
19 – ENERGY CRYSTAL
20 – SIGHTS
21 – NOVADRIVE
22 – INTERSTELLAR CRAFT
23 – CHEESE
24 – METAL DETECTOR
25 – KITCHEN SINK
26 – ANTENNA
27 – ESSENTIAL 12939 SUPPLY
28 – PHOTON EMITTER
29 – PALYAR DIAMOND SHIP
30 – LAND DART
31 – JET DART
32 – CAR
33 – GOLD (?)

1 2 3 4 5
A B
3·04
3ø
M
C
1/F →
N

DRAWN BY CHRISTOPHER HESTER

ORANGE WALL-LESS ROOM

DARK ROOM

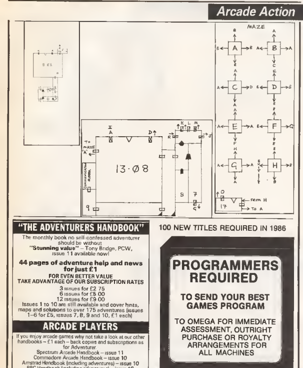
△ – ENTRY POINT TO AUTHOR'S CHEAT ROOM (NO KEY AVAILABLE)

HANGARS AT LOCATIONS:–

LOC.	COLOUR
3 ø4	BROWN
5·13	GREY
13 ø8	GREEN
14 15	CYAN
8 **	CYAN
** ø8	BROWN
COLONY CRAFT	BLUE

OBJECTS OUTSIDE CITY:–

LOC.	NAME
8 69	SHIP?
8· 96	PYRAMID


MAZE
13·08
TO MAZE 'A'
FROM H
TO A
"THE ADVENTURERS HANDBOOK"
The monthly book no self-confessed adventurer should be without
"Stunning value" – Tony Bridge, PCW, issue 11 available now!
44 pages of adventure help and news for just £1
FOR EVEN BETTER VALUE
TAKE ADVANTAGE OF OUR SUBSCRIPTION RATES
3 issues for £2.75
6 issues for £5.00
12 issues for £9.00
Issues 1 to 10 are still available and cover hints, maps and solutions to over 175 adventures (issues 1–6 for £5, issues 7, 8, 9 and 10, £1 each)
ARCADE PLAYERS
If you enjoy arcade games why not take a look at our other handbooks – £1 each – back copies and subscriptions as for Adventurer.
Spectrum Arcade Handbook – issue 11
Commodore Arcade Handbook – issue 10
Amstrad Handbook (including adventures) – issue 10
BBC Handbook (including adventures) – issue 10
C16/Plus 4 Handbook (including adventures) – issue 4
Send cheque or PO to:
H&O SERVICES (PCW)
1338 Ashton Old Road
Higher Openshaw
Manchester M11 1JG
Tel: 061-370 5668
100 NEW TITLES REQUIRED IN 1986
PROGRAMMERS REQUIRED
TO SEND YOUR BEST GAMES PROGRAM
TO OMEGA FOR IMMEDIATE ASSESSMENT, OUTRIGHT PURCHASE OR ROYALTY ARRANGEMENTS FOR ALL MACHINES
OMEGA
Omega Software
8 King's Yard Carpenter's Road
London E15 2HD
Tel: 01 985 6877

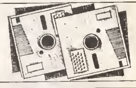
Programming: BBC

Pager

by Alan Griffiths

This program lists the names of all the Roms present in the machine in order of socket number. It also gives the Rom number indicating service and language entry points and allows any Rom to be switched off by poking zero into the relevant paged Rom type table at &2A1.

Note that pressing *Break* will turn all the Roms back on again.



```
10ON ERROR MODE 7:END
20MODE 7:Y=16
25?&FE=0:Y=0
30PRINTTAB(1,1);"SOCKET";TAB(3,2);"NO.";TAB(10,1);"ROM";TAB(10,2);"NO.";TAB(15,2);"TITLE";TAB(27,2);"STATUS"
40FOR A=0 TO 15
50B=&2A1+A
60PRINTTAB(4,5+A);A;TAB(11,5+A);?B;"
"
70IF ?B>0 PROCNAME
80IF ?B=0 PRINTTAB(15,5+A);CHR$(131);TAB(29,5+A);"OFF" ELSE PRINTTAB(29,5+A);"ON"
90 NEXT
100PRINTTAB(1,22);"PRESS SPACE BAR TO ALTER STATUS"
110PRINTTAB(12,23);"ESC TO END"
120REPEAT:UNTIL INKEY-99:PROCSTATUS:GOTO30
130END
140DEFPROCSTATUS
150PRINTTAB(1,22);"
160INPUTTAB(1,22);"SOCKET",C
170IF C<0 OR C>15 GOTO160
180?(&2A1+C)=0
190ENDPROC
200DEFPROCNAME
210A%=10
220start=&8009
230pointer=0:X=16
240REPEAT
250location=start+pointer
260Y%=A
270?&F6=location MOD 256
280?&F7=location DIV 256
290result%=USR(&FFB9)
300PRINTTAB(15,5+A);CHR$(130)
310byte=result% AND 255
320IF byte>31 AND byte<129 PRINTTAB(X,5+A);CHR$(byte)
330pointer=pointer+1
340X=X+1
350UNTIL pointer=12 OR byte=0
355IF X<20 PRINTTAB(X,5+A);"AND ROM"
360ENDPROC
```

Programming: Spectrum 128

Wobbling Jellies

by M D Lancaster

The following program for the 128K Spectrum will produce fast and complex animation routines.

This is done by storing the screen display as frames in the Ram disc and then using *Load!* to replay them in sequence.

If the program is *Run* it will generate the plots and save them to *Ram* before giving the option of saving the frames to cassette or microdrive. However, since the function used is a complex one the demonstration will take two hours to be generated.

This idea of using the *Ram* disc to store clean frames in can be applied in various way to create fast animation.

The above illustration is an example of the wobbly jelly. The listing for this program begins on the following page.

```
10 REM
20 REM Set up initial variables and loops.
30 REM
40 LET c=0
50 FOR t = 0.1 TO 7 STEP (7/13)
60 REM
70 REM Function to be plotted.
80 REM
90 DEF FN a(x,y)=t*EXP (2*COS ((x*x+y*y)*.001))
100 FOR x=0 TO 127
110 LET y=SQR (16129-x*x)
120 LET m=-1e9
130 FOR z=-y TO y STEP 4
140 LET k=FN a(x,z)
150 LET p=k+z/4+88
160 IF p<=m THEN GO TO 190
170 LET m=p
180 PLOT 128+x,p: PLOT 128-x,p
190 NEXT z
200 NEXT x
210 REM
220 REM Save screen to ram disc.
230 REM
240 SAVE !CHR$ (65+c)CODE 16384,6144
250 CLS
260 LET c=c+1
270 NEXT h
280 GO TO 630
290 REM
300 REM Display sequence of 12 frames.
310 REM
320 CLS
330 FOR f = 65 TO 76
340 LOAD !CHR$ (f)CODE
350 NEXT f
360 FOR f = 75 TO 66 STEP -1
370 LOAD !CHR$ (f)CODE
380 NEXT f
390 GO TO 330
400 REM
410 REM Routine to load frames from ram disc and save to microdrive.
420 REM
430 CLS : PRINT AT 5,3; Insert a cartridge with ;AT 7,3;"at least 90K of free space."
440 PRINT AT 9,3;"Press any key when ready"
450 PAUSE 0
460 FOR f = 65 TO 76
470 LOAD !CHR$ (f)CODE
480 SAVE *"m";1;CHR$ (f)CODE 16384,6144
490 NEXT f
500 SAVE *"m";1;"function" LINE 550
510 GO TO 290
520 REM
530 REM Load frames from microdrive and save to ram disc.
540 REM
550 FOR f = 65 TO 76
560 LOAD *"m";1;CHR$ (f)CODE
570 SAVE !CHR$ (f)CODE 16384,6144
580 NEXT f
590 GO TO 290
600 REM
610 REM Frames now generated prompt for storage media.
620 REM
630 PRINT AT 5,3;"Save to (M)icrodrive."
640 PRINT AT 7,3;"      or (T)ape."
650 INPUT a$
660 IF a$="m" OR a$="M" THEN GO TO 400
670 IF a$<>"t" AND a$<>"T" THEN GO TO 650
680 REM
690 REM Save to tape
700 REM
710 SAVE "function" LINE 800
720 FOR f = 65 TO 76
730 LOAD !CHR$ (f)CODE
740 SAVE CHR$ (f)CODE 16384,6144
750 NEXT f
760 GO TO 290
770 REM
780 REM Load frames from tape and save to ram disc.
790 REM
800 FOR f = 65 TO 76
810 LOAD CHR$ (f)CODE
820 SAVE !CHR$ (f)CODE 16384,6144
830 NEXT f
840 GO TO 290
```


Multi Sided Shapes

by Stephen Salmon

This program runs on a non-expanded QL using a monitor although line 160 can be changed to *Mode 8* to suit a TV

When the program is first run an opening demonstration screen is drawn showing the three options available These are displayed in the menu in the bottom right hand corner of the screen

Multi Sided Shapes is made up of three procedures which can be incorporated into your own programs These are *Shapes Prisms* and *Plains*

Shapes will draw polygons, the pattern of which can be altered by changing the value of *Step* in line 1530 The *Prisms* procedure draws them with both ends open The patterns can be altered by introducing a *Step* command into line 1770 The pattern produced by the *Plains* procedure can also be altered by changing the *Step* value in line 1990 The positions of the displays can be altered by using the *X Centre* and *Y Centre* values

```
170 WINDOW#1 512,10,0 246
180 MODE 4
190 PAPER 254
200 CLS
210 LET LIMIT=50
220 LET NUMBER_OF_SIDES  5
230 WINDOW#1 256 123 0 0
240 MULTI_SIDED_SHAPES
250 CSIZE 2,0
260 CURSOR #1,0,90
270 PRINT"SHAPES"
280 CURSOR #1 5,0
290 PRINT "(1)"
300 WINDOW#1 256,123,254,0
310 LIMIT = 40
320 DEPTH = 70
330 NUMBER_OF_SIDES=7
340 PRISM
350 INK 0
360 PRINT  (2)"
370 CURSOR #1,0 85
380 PRINT "PRISMS"
390 WINDOW #1 254 123,0,123
400 NUMBER_OF_PLAINS = 4
410 plains
420 INK 0
430 CURSOR #1,0,0
440 PRINT "(3)"
450 CURSOR #1,0 91
460 PRINT "PLAINS"
470 MENU
510 DEFine PROCedure MENU
520 WINDOW #1 254 123 254,123
540 CLS PAPER #1,7,0:CLS
560 INK #1,0
570 CSIZE 3 1
580 PRINT"      MENU"
590 CSIZE 2,0
600 PRINT
610 PRINT"  (1)   SHAPES"
620 PRINT"  (2)   PRISMS"
630 PRINT"  (3)   PLAINS"
640 PRINT
650 UNDER 1
660 PRINT"  PRESS KEY FOR         PROGRAM . . .   "
670 UNDER 0
680 IF INKEY$="1" THEN MULTIIN
690 IF INKEY$="2" THEN PRISMIN
700 IF INKEY$="3" THEN PLAININ
710 GO TO 680
720 END DEFine MENU
740 DEFine PROCedure MULTIIN
750 CLS
760 CSIZE 3,1
770 PRINT "    SHAPES "
780  PRINT
790 CSIZE 2,0
800 PRINT" INPUT THE NUMBER OF
SIDES YOU WISH YOUR  SHAPE TO HAVE"
805 PRINT"IN THE RANGE 3 to 20"
810  INPUT NUMBER_OF_SIDES
820 IF NUMBER_OF_SIDES<3 OR NUMBER_OF_SIDES>20
THEN GO TO 810
830 PRINT "INPUT THE SIZE  10 50"
840 INPUT LIMIT
850 IF LIMIT<10 OR LIMIT>50 THEN GO TO 840
860 CLS
870 WINDOW#1 512,246,0,0
880 MULTI_SIDED_SHAPES
890 CSIZE 3 1
900 CURSOR #1,0 0
910 INK 0
920 PRINT NUMBER_OF_SIDES;" SIDES"
930 CURSOR#1 0 180
940 CSIZE 2,1
950 PRINT"PRESS ANY KEY"
960 PAUSE 99999
970 MENU
980 END DEFine MULTIIN
1000 DEFine PROCedure PRISMIN
1020 CLS:INK 0
1030  CSIZE 2,1
1040 PRINT"    PRISMS"
1050 CSIZE 2 0
1060 PRINT
1070 PRINT"INPUT THE NUMBER OF"
1075 PRINT"SIDES YOU WANT TO YOUR OPEN ENDED"
1078 PRINT"PRISM 4 15"
1080 INPUT NUMBER OF_SIDES
1090 IF NUMBER OF SIDES<4 OR NUMBER_OF_SIDES>15
THEN GO TO 1080
1100 PRINT "INPUT DEPTH 10-90"
1110 INPUT DEPTH
1120 IF DEPTH<10 OR DEPTH>90 THEN GO TO 1110
1130 PRINT "INPUT SIZE 10 50"
1140 INPUT LIMIT
1150 IF LIMIT 10 OR LIMIT>50 THEN GO TO 1140
1170 CLS:WINDOW#1 512,246,0,0
1180 PRISM
1190 CSIZE 3 0
1200 CURSOR #1,0 215
1210 INK 0
1220 PRINT "PRESS ANY KEY"
1230  PAUSE 99999
1240 MENU
1250 END DEFine PRISMIN
1270 DEFine PROCedure PLAININ
1290 CLS:CSIZE 3,1
1300 PRINT"    PLAINS"
1310 PRINT
1320 CSIZE 2,0
1330 PRINT"INPUT THE THE NUMBER OF PLAINS YOU"
1335 PRINT"WANT ON THE SCREEN IN THE RANGE 3 25"
1340 INPUT NUMBER OF_PLAINS
1350 IF NUMBER_OF PLAINS<3 OR  NUMBER_OF
PLAINS>25 THEN GO TO 1340
1370 CLS:WINDOW#1 512,246 0 0
1380 plains
1390 INK 0
1400 CURSOR#1,0 0
1410 CSIZE 3,1
1420 PRINT"PRESS ANY KEY"
1430 PAUSE 99999
1440 MENU
1450 END DEFine PLAININ
1490 DEFine PROCedure MULTI_SIDED_SHAPES
1510 CLS:BORDER 15,40
1520 PAPER 254
1530 FOR OUTLINE = 0 TO LIMIT STEP  5
1540 X_CENTRE = 90
1550 Y_CENTRE   50
1560 HORIZONTAL = X_CENTRE - OUTLINE
1570 VERTICAL = Y_CENTRE
1580 FOR P = 0 TO 361 STEP 360/NUMBER_OF_SIDES
1590 LET HORIZONTAL_2 = X CENTRE - OUTLINE * COS
(P*PI/180)
1600 LET VERTICAL_2 = Y CENTRE + OUTLINE * SIN
(P*PI/180)
1610 INK P/NUMBER OF SIDES
1620 LINE HORIZONTAL VERTICAL TO HORIZONTAL_2,
VERTICAL_2
1630 HORIZONTAL = HORIZONTAL_2
1640 VERTICAL = VERTICAL_2
1650 END FOR P
1660 END FOR OUTLINE
1670 END DEFine MULTI_SIDED SHAPES
1710 DEFine PROCedure PRISM
1720 Y_CENTRE = 50
1730 X_CENTRE   110
1750 CLS PAPER 254
1760 BORDER #1,10,50
1770 FOR PRISM_LOOP = 1 TO DEPTH
1780 HORIZONTAL=X_CENTRE-LIMIT
1790 VERTICAL=Y_CENTRE
1800 FOR P=0 TO 361 STEP 360/NUMBER_OF_SIDES
1810 HORIZONTAL_2   X_CENTRE   LIMIT
* COS(P*PI / 180)
1820 VERTICAL_2 = Y CENTRE + LIMIT * SIN(P*PI / 180)
1830 INK P/NUMBER_OF_SIDES
1840 LINE HORIZONTAL,VERTICAL TO HORIZONTAL_2,
VERTICAL_2
1850 HORIZONTAL - HORIZONTAL_2
1860 VERTICAL - VERTICAL_2
1870 END FOR P
1880 LET X_CENTRE = X_CENTRE  .5
1890 LET Y CENTRE = Y_CENTRE
1900 END FOR PRISM_LOOP
1910 END DEFine PRISM
1950 DEFine PROCedure plains
1960 PAPER 254
1970 BORDER #1,10,30
1980 CLS:FOR a=30 TO 50 STEP .75
2000 LET X_CENTRE 130:LET Y CENTRE=90
2010 LET HORIZONTAL=X_CENTRE - a
2020 LET VERTICAL = Y_CENTRE
2030 FOR B=0 TO 361 STEP 360/(NUMBER_OF_PLAINS-1)
2040 LET HORIZONTAL_2=X_CENTRE - a*COS (B*PI/180)
2050 LET VERTICAL_2=Y_CENTRE + a*SIN (B*PI/180)
2060 INK B/NUMBER_OF PLAINS/2
2070 LINE HORIZONTAL VERTICAL TO HORIZONTAL_2
HORIZONTAL_VERTICAL 2   VERTICAL
2080 LET HORIZONTAL   HORIZONTAL_2
2090 LET VERTICAL = VERTICAL 2
2110 NEXT B:NEXT a
2120 END DEFine plains
2140 SAVE MDV1_BOOT
```

Road Toad

by Graham Tyson

On we go with part two of Road Toad. The line numbers must remain exactly as printed or the error checking routine will report a fault in the wrong place.

If you can't be bothered with the typing then send £2 (no cheques) to 38 York House, Idlethorp Way, Thorpe Edge, Bradford BD10 9ES.

```
[illegible]
235 DATA [illegible] 7F,5[illegible],32,8[illegible],7F,[illegible]
[illegible] 34,5E,7F,3[illegible],32,5E,7F,18 64, 1876
236 DATA AF [illegible],7F,[illegible],9B,7E,[illegible],90,7E [illegible]
[illegible] 35,C1 F0,00,ED,B[illegible],01 F[illegible], [illegible]
237 DATA 07,EB 09 3E,BF BC 3[illegible],34,[illegible] 5 [illegible]
[illegible] C9,EB [illegible] E9,C9,[illegible] 1917
238 DATA [illegible]
[illegible]
239 DATA [illegible]
[illegible] 00,FF,3E,00,CC,[illegible],00 [illegible]
240 DATA [illegible]
[illegible]
241 DATA [illegible]
[illegible]
242 DATA [illegible]
[illegible]
243 DATA [illegible]
[illegible],C[illegible] 00 [illegible]
244 DATA [illegible]
[illegible] 15,00 CD,C0,BB,2[illegible], 93[illegible]
245 DATA [illegible]
[illegible] 15,00 CD,C0,BB,2[illegible], [illegible]
246 DATA 59,7E,06 05,3E F[illegible] 86 05 [illegible],7D [illegible]
[illegible] BB E1 [illegible] C9,C0,[illegible] 1652
247 DATA [illegible]
[illegible]
248 DATA [illegible]
[illegible] 4F,5C,45 4C 45 56,45,4C,DD, 977
249 DATA 21,AB [illegible] DC 7F,[illegible],25,[illegible]
[illegible] E7,[illegible],4F D[illegible],7E [illegible],FE,0[illegible],2E, [illegible]
250 DATA 32,CB 47 2[illegible] EA,EE,CB 4F,2[illegible]
[illegible] E6 DD,CB 57,2[illegible] E[illegible] BB,CB,5F, 263[illegible]
251 DATA 2[illegible] E6,7[illegible] CB 67,2[illegible] E6,EE,C[illegible]
[illegible] 6F 20,[illegible] E6 DD CB 77 2[illegible] E6 2576
252 DATA BB CB 7F,20 [illegible] 77,B[illegible] 77 [illegible]
[illegible] 2577
253 DATA [illegible]
[illegible] 380
254 DATA [illegible]
255 DATA [illegible]
256 DATA [illegible]
257 DATA [illegible]
258 DATA [illegible]
259 DATA [illegible]
260 DATA [illegible]
261 DATA [illegible]
262 DATA [illegible]
263 DATA [illegible]
264 DATA [illegible]
265 DATA [illegible]
266 DATA [illegible]
267 DATA [illegible]
268 DATA [illegible]
269 DATA [illegible]
270 DATA 21,6B,[illegible]
[illegible] 1734
271 DATA 82,C[illegible] ED,80,11,44 [illegible]
272 DATA [illegible]
273 DATA [illegible]
274 DATA [illegible]
275 DATA [illegible]
276 DATA [illegible]
277 DATA E3,[illegible] 1733
278 DATA [illegible]
279 DATA 82 [illegible] 1746
280 DATA C3,CD,2E,[illegible]
281 DATA [illegible]
282 DATA [illegible] 2272
283 DATA [illegible] 2237
284 DATA [illegible] 2374
285 DATA [illegible]
286 DATA [illegible] 2844
287 DATA [illegible]
288 DATA [illegible]
289 DATA [illegible]
[illegible]
```

continued on page 30 ▶

Programming: Amstrad 464

```
289 DATA 98,06,[illegible],05,[illegible],D6,[illegible],D5,ED,B[illegible] D
1,EB,C9,26 BC,EB,[illegible],1C,F0,E1,11, 299[illegible]
290 DATA 08,[illegible],19,EB,C1 10,E[illegible],C9,CC,[illegible],2
2 [illegible] 09,3C [illegible],C[illegible],F0 73 [illegible] 1837
291 DATA [illegible] 41 [illegible] 60,1C [illegible] 2
[illegible] 2[illegible] 01,[illegible] 02 10 [illegible] 1275
292 DATA 40 [illegible] 5[illegible],07 [illegible] 22,08,80,13,0
[illegible],30 [illegible] 30 [illegible] 4[illegible] [illegible]
293 DATA 14,81 40,[illegible],86,0C,[illegible],2[illegible],44,0
[illegible] 43,77,77 44, [illegible]
294 DATA 77,77,22 2[illegible],20,44,55 45,55,22,2
2 40 31 77 77,2[illegible],77 22,2[illegible],21 [illegible] 47[illegible]
295 DATA [illegible] 44 44,5[illegible],2[illegible],4[illegible],77 44,7
[illegible]
296 DATA [illegible],28,[illegible]
[illegible] 4[illegible] 4[illegible] 70,3[illegible] 293
297 DATA 81 0F,39 02 [illegible]
[illegible] 14 40 66 40,[illegible],62,52 2[illegible] [illegible]
298 DATA 4[illegible],22,70,5[illegible],02,40 40,3[illegible]
2 [illegible],04,2[illegible] 3[illegible] 04 [illegible] 1 [illegible]
299 DATA [illegible] 04,0[illegible],04,0[illegible]
[illegible] 38 [illegible] 33,[illegible],26 33 [illegible]
300 DATA [illegible],CC,77,EE,33,66 77,EE [illegible],7
7,[illegible] 33,5[illegible] 8[illegible] [illegible],5F,FF 2265
301 DATA 99 [illegible] 4[illegible] EE,88 [illegible] FF,B8,88,FF 5
5 [illegible],55,F[illegible],DD,[illegible],33, 3729
302 DATA [illegible] 77 EE 9[illegible],0[illegible],88 [illegible]
[illegible] 07 C[illegible] 2 0[illegible],[illegible]4 44, 342
303 DATA [illegible] (9,[illegible],2
[illegible] 743
304 DATA 9[illegible] C,2[illegible] 9 [illegible] 7 12,2[illegible],98,[illegible]
[illegible] 874
305 DATA 4 [illegible] 6,12 32, [illegible] 14,[illegible]
[illegible] 44 77 EE [illegible]
306 DATA [illegible]
[illegible].44,46,[illegible] 6,[illegible] 4A,08 03 [illegible] [illegible]
307 DATA [illegible]6,04 EE 44 A 0[illegible] AA [illegible],29 E
E AA 1[illegible] 5[illegible] 2[illegible],44 [illegible] 33 [illegible]07
308 DATA [illegible] 8[illegible] 2[illegible] 5[illegible],44 44,77 EE 2[illegible],0
[illegible]0,0[illegible],0F 0F,0F, [illegible]
309 DATA 0F,38,0C [illegible] A 0
[illegible],0E 0A.44,66 0[illegible] 38 AA [illegible], 2[illegible]
310 DATA 08,22 99 [illegible] 44 99 0[illegible],0[illegible],80 9
[illegible],0A EE 66,0[illegible] 0,03,15,0B [illegible]35
311 DATA 06 [illegible],0D [illegible] 0C [illegible]
[illegible] 13,0[illegible] 0[illegible],0C 3[illegible] 9[illegible] [illegible]
312 DATA 45,40 1[illegible],31,9[illegible] [illegible] 8[illegible] 2
[illegible] 90 20,40 44,66,2[illegible],44,0C,99,[illegible]7.
313 DATA 40,9[illegible],44 [illegible],2[illegible] 40,44,99 [illegible] 30,4
4,99,50,40 E[illegible] 1[illegible],30,90, 1835
314 DATA A0 [illegible],6[illegible] 80 A [illegible],80,30,4[illegible] 2[illegible],7
0,03,3[illegible],C0,00,00,[illegible] 0[illegible], 1296
315 DATA [illegible] 00,0[illegible],0[illegible],00,[illegible],00 [illegible]
0,00,00,0[illegible],00,0C,0[illegible],0[illegible],0[illegible],00, 0
316 DATA 00,00,0C,00,00,00,00,0[illegible] 00,F
0,E0 0[illegible],0[illegible].F0,F0 [illegible] 30,F0,E[illegible],[illegible], 140[illegible]
317 DATA 00,00,0C,00,00,0[illegible].0[illegible].0[illegible],3[illegible],C0,0
0,0[illegible] 00 03.00,[illegible],00,F0,C0,0[illegible],[illegible], 432
318 DATA 96 F0,00,00,D2 F0,8[illegible] [illegible] D2 F, 8
0,00,D2,F0,00,00,D2,F0,90,[illegible] 2984
319 DATA F0 00,30,F0,C0 [illegible] 3,40,0C,77 D
C,48 1F,FF,FE,4B,1F,FF F[illegible] 42,[illegible]F. 2490
320 DATA FF,FE,48,0C,77,DC,[illegible] 00 [illegible],0,J
C,00,0[illegible],3C,00,00,00,2[illegible],0[illegible],0[illegible] 7[illegible] [illegible]43
321 DATA F0,0[illegible] 00 F[illegible].F0,0C,00,F0,F0.[illegible],0
[illegible] F0,0[illegible] 0[illegible] F[illegible] F0 00 0[illegible],F[illegible] F[illegible] 2640
322 DATA 00.00,F0,F0,00,00,70,F0,00,00,0
A 0F,00,F0,E1,0F,10.F0.E1,0F,00, 1023
323 DATA F0,E1.0F,00,00,00,0F,00,00,00,0
0.10 00,00,00,00,00,00,00,07,0F, 517
324 DATA 0F,08,0F,0F,0F,0[illegible],16,F0,F0,0C,0
7.0F,1E,2C,07,0F,1E,2C,07,0F,1E, 338
325 DATA 2C,07,0F,1E,2C,07,0F,1E,CC,07,0
F,1E,0C 17,0F,1E.2C,07,0F,1E,2C, 460
326 DATA 07,0F,1E,2C,07.0F,1E,2C,16,F0,F
0,0C,0F,0F,0F,0[illegible],07.0F,0F,0[illegible],0F, 523
327 DATA CF,0F,0F,00,01,00,00,0F,0F.0F,0
F,0F,0F,0F 0F,0F,0F,0F,0F,0F,0F, 256
328 DATA 0F,0F,0F,0F,0F,0F,0F,0F,0F,0F,0
F,0F,0F,0F,0F,CF,0F,0F,0F,0F,0F, 315
329 DATA 0F,0F,0F,0F,0F,0F,0F,0F,0F,0F,0
F,0F,0F,00,C1,00,00,0F,0F,0F,0F 256
330 DATA 03,0F,0F,0C,07,0F,0F,08,07,0F,0
F,08,87.0F,0F,08,87,0F,0F,08,87, 619
331 DATA 0F,0F,08,07,0F,0F,08,1E,F0,E[illegible],0
8,16,F0.E1,08,07,0F,0F,08,87,0F, 1268
332 DATA 0F,08,87,0F,0F,08,87,0F,0F 08,0
7,0F.0F 08.07,0F,0F,08 C3,0F,0F. 495
333 DATA 0C,0F,C3,3C,87,78,0F 1E,87,69,1
E,0F,0F.87,0F,3C,96,E[illegible],78,3C,3C, 1707
334 DATA 96 C3,C3 F0,3C,E1,78,C3,F0 B4.9
6,E1 69.78 96,96.C3,C3,F0 3C,E1, 36[illegible]
335 DATA 78,C3 D2,F0,96 E1.69,78,96 96,C
3 C3,C3.78,E1 78,C3,1E,F0,C3,0F, 3390
336 DATA E1.78.96,87 1E,C3,0F,F0,E1,78.C
3,1E,F0,3C,E[illegible] 78,96,96,3C,C3, 3[illegible]20
337 DATA C3,78,E1,78.C0,D2,F0,F0,3C,F0 3
C,3C.96,96,C3,F0,3C,E1 78,[illegible]3,F0, 3540
338 DATA B4 E1 1E.F0 87 78,0F,87,87,69 1
E,0F,0F,87,0F 3C,F0,00.[illegible].0[illegible],F0, 2070
339 DATA 80,00,00,FE,80,00,0[illegible],F6,80,00,C
0,F6,30,00,00,F6,90.00,00.F6,80. 2006
340 DATA 00,80 F6,80,00,00 F6 80,00,00.F
6,90,00,00 F6,80.00.00,F6 80 00, 1870
341 DATA 00.F6,80,00,00.FE,80,00 00,F0.8
0 00.00.F0.00,00,00,F0,F0,F0.F0, 2324
342 DATA F0,F0 F[illegible],F0,FF,FF,FF,FF,F0 F0,F
0 F0,F0,F0,F0,F0,F0,F0,F0 F0,F0, [illegible]
343 DATA F0.F0,F0 F0,F0.F0,F0 F0,F0,F0,F
0,F0,F0 F0,F0,F0 F0 F0.F0,F0,F0 5045
344 DATA F0 F0,F0 F0,F0 F0,FF,FF,FF FF,F
[illegible] F[illegible],F[illegible],F0,F0 [illegible],F0 00 C0,00, 4380
345 DATA F0,0E,[illegible] 1[illegible],F0,1E,[illegible] 1[illegible],F7,1E,F
F,FE,F4,1E FF,FE,F4,1E,00,10,F4. 2659
346 DATA 1E,00.10,F4 1E,05,14,F4 1E,0[illegible],1
A,F4,1E,00,10 F4 1E.00.14 F4 1E. 1509
347 DATA FF FE F4 1E,FF,FE,F4,1E,[illegible] 10,F
7,0E,[illegible] 10,F0 0[illegible],00,0[illegible] F0,[illegible]0 0[illegible], 2309
348 DATA 00.00,00,00,0[illegible],0F,10,03,0F 0F,3
0 F0,C3,0F,71,FF 1[illegible],0F,F2,F0,C3, 1[illegible]
349 DATA 0F F4.F0.C3 0F F4 F0 C3,0F,F4,F
A,C3,0F,F4,F0,C3 0F,F2,F0,C3.0F. 3493
350 DATA 71,FF,CB,0F,3[illegible] F0,C3,0F,03,03,0
F,0F,00,00 01,0F 00,0[illegible] 00,0[illegible] 1 . [illegible]
351 DATA 00,00,00,0F,0F,0F,08 0F,0F,F[illegible],0
C.00,01 F7,86 0F,01 F7,DA,0F,0F 1212
352 DATA F7,[illegible],F[illegible],F0 F7 ED,FE,FF,FF ED,F
E.F[illegible] F[illegible],ED,F[illegible],F0 F7,ED,0F,0F F7 4657
353 DATA C8,0F [illegible],F7,[illegible]A,0[illegible],01,F7,86,0F,0
F [illegible],0C.0F,0F,0F,[illegible] [illegible] .385
354 DATA 03,0[illegible],0[illegible],0F,0F.0E,07,0F,0F,0F,[illegible]
[illegible] 1[illegible]
355 DATA 0F,0F,0F,F[illegible],F0 [illegible] FD.FF,FF,F
B F[illegible],F[illegible] FB F[illegible],F[illegible],F0 F[illegible] 0F,0F [illegible]
356 DATA 0F,0F,0F,0F,0F [illegible]
F,[illegible] 0F,0F,0F,0E 07.0F,0[illegible] [illegible] 201
357 DATA 00,[illegible],00,[illegible],00 [illegible],0F,0F.0F.03,F
[illegible],0F 0F,16.FE,08,00,3[illegible] [illegible].0F. 330
358 DATA 3D,FE 0F 0F,7B.FE F0,F0,7B,FF,F
F,F7,7B,F[illegible],FF,F7,7B,FE.F0 F0 3D. 3080
359 DATA FE,0F,0F,35,FE,08 0F,16,FE,08,0
[illegible].03,F0 0F.3F,01,0F,0F 0F,0[illegible] 0[illegible], 1217
360 DATA 00,00,30,60 [illegible] 00,[illegible],00,30,60,F
0,30,C0,30,60,00,F0,F0, 2544
```

Programming: C64

Minz

by Ken Smith

The object of Minz is to destroy the targets in nine locations whilst avoiding or shooting, the rocket, balloon and helicopter. Also to be avoided are the mines which appear at the start of a screen before becoming invisible. Full instructions are given in the program.

The listing is quite long and will be presented over three weeks, so if you don't want to type it in send £2 to Ken Smith, 73 Wakefield Street, East Ham, London E6 1NR for a copy on cassette.

```
10 FORJ=33280TO40000 READA POKEJ,A NEXT
30 SYS27200
70 POKE53280,0 POKE53281,0 POKE252,0 POKE646,7
90 V=53248
130 POKEV+28 255 POKEV+37,7 POKEV+38,2
140 POKEV+39,6 POKEV+40,0 POKEV+41,6 POKEV+42,3 POKEV+43,7 POKEV+44,3
150 POKEV+45 6 POKEV+46 6 POKE2040 37
160 POKE2040 41 POKE2041 20 POKE2042 42 POKE2043 20 POKE2044 40
161 POKE2045 44 POKE2046 46 POKEV 50 POKEV+1 64 POKEV+2,80 POKEV+3 96
162 POKEV+4 70 POKEV+5 122 POKEV+6 50 POKEV+7 160 POKEV+8 80 POKEV+9 200
163 [illegible]
1070 [illegible] PRINT "[illegible]"
1680 PRINT "[illegible] TO HAVE FOUR TRIES TO DESTROY THE
1690 PRINT "[illegible] ATTACKERS IN MINE LOCATION."
1700 PRINT "[illegible]COLLISION WITH ANY OBJECT DESTROYS [illegible]
1710 PRINT "[illegible]
1720 PRINT "[illegible] ARE HIDDEN BUT ARE VISIBLE
1730 PRINT "[illegible] EACH TIME SETS OUT "
1740 PRINT "[illegible] RETURN" POKE198,0
1750 GETA$ IFA$<>CHR$(13) THEN1750
1760 GOTO 1770
1770 PRINT "[illegible]"
1780 PRINT "[illegible] THE IMAGES AND THE SCREEN
1790 PRINT "[illegible] MINE ARE REPOSITIONED "
1800 PRINT "[illegible] TARGETS AND YOU MOVE"
1810 PRINT "[illegible] NEXT LOCATION AN EXTRA [illegible]"
1820 PRINT "[illegible] BE GIVEN [illegible] SCREEN IS CLEARED "
1830 PRINT "[illegible] HAS A LIMITED RANGE YOU MUST"
1840 PRINT "[illegible] CLOSE ENOUGH FOR THE EXPLOSION"
1850 PRINT "[illegible] TO DESTROY THE TARGET"
1860 PRINT "[illegible] RETURN" POKE198,0
1870 GETA$ IFA$<>CHR$(13) THEN1870
1880 [illegible]
[illegible]
```

continued on page 32 ▶

```
[illegible]
```

VDU

by Alastair Scott

This program, for any Amstrad CPC, provides a *VDU* command like on the BBC micro. The syntax is */VDU a,b,c* Up to 84 parameters can be passed.

For example, */VDU,4,1,15,3,65* sets *Mode 1*, *Pen 3* and prints 'A'

```
100 REM VDU by Alastair Scott
110 MODE 1:MEMORY &A63F
120 FOR a=&A640 TO &A674
130 READ b$:POKE a,VAL("&"+b$)
140 NEXT:CALL &A640:PRINT" VDU command O
K."
150 DATA 01,49,A6,21,75,A6,C3,D1,BC,4E
160 DATA A6,C3,52,A6,56,44,D5,0C,FE,00
170 DATA CA,FE,01,2A,16,47,05,DD,23,DD
180 DATA 23,10,FA,47,DD,7E,00,CD,5A,BB
190 DATA DD,2B,DD,2B,10,F4,C9,DD,7E,00
200 DATA C3,5A,BB
```

Money Maker

by D G Evans

This program for any Spectrum will generate money £10 notes to be specific. Just type it in, and it can be easily converted to other machines, run the program and you'll see what I mean. A little effort on your part and you could soon be rolling in the brown notes.

```
  10 REM Money Maker
  20 CLS : PRINT INK 6; PAPER 2;"      M
oney Maker Utility      "
  30 PRINT : FLASH 1: FOR f=1 TO 85
  40 READ b
  50 PRINT CHR$ (b);
  60 NEXT f
  70 DATA 87,104,121,32,110,111,116,32,1
15,101,110,100,32,105,110,32,121,111,117
,114,32
  80 DATA 115,104,111,114,116,32,112,114
,111,103,114,97,109,115,32,102,111,114,3
2,66,121,116,101,115,32,97,110,100,32,80
,105,101,99
  90 DATA 101,115,32,97,110,100,32,101,9
7,114,110,32,121,111,117,114,115,101,108
,102,32,97,32,116,101,110,110,101,114,32
,63
```

Status

by Alastair Scott

After typing in and correcting any errors this program for any Amstrad CPC should be called by entering */S*

Three five digit numbers are now produced. They are as follows:

1 Length of the Basic program in memory
2 Length of the variable area
3 Free memory

```
100 ' Status
110 ' by Alastair Scott
120 cs=0:MODE 2:MEMORY &9FFF
130 FOR addr=&A000 TO &A099
140 READ byte$:POKE addr,VAL("&"+byte$)
150 cs=cs+PEEK(addr)
160 NEXT
170 IF cs<>18108 THEN PRINT CHR$(7)"DATA
 ERROR!":END
180 CALL &A000:PRINT"|S command OK.":END
190 DATA 01,18,A0,21,99,A0,CD,D1,BC,CD
200 DATA 00,B9,F5,3A,02,C0,A7,CC,7A,A0
210 DATA F1,C3,0C,B9,1D,A0,C3,1F,A0,D3
220 DATA 00,2A,66,AE,ED,5B,64,AE,ED,52
230 DATA CD,44,A0,2A,6C,AE,ED,5B,66,AE
240 DATA ED,52,CD,44,A0,2A,5E,AE,ED,5B
250 DATA 6C,AE,ED,52,CD,44,A0,C9,11,10
260 DATA 27,CD,67,A0,11,E8,03,CD,67,A0
270 DATA 11,64,00,CD,67,A0,11,0A,00,CD
280 DATA 67,A0,11,01,00,CD,67,A0,3E,20
290 DATA C3,5A,BB,AF,37,3F,ED,52,38,03
300 DATA 3C,18,F7,19,C6,30,E5,CD,5A,BB
310 DATA E1,C9,21,83,AE,22,20,A0,22,30
320 DATA A0,21,81,AE,22,24,A0,21,89,AE
330 DATA 22,2C,A0,22,3C,A0,21,7B,AE,22
340 DATA 38,A0,C9,00,00,00,00,00,00,00
```



With Kenn Garroch

The Amsdos hex

Alastair Scott, of Grangemouth, in Stirlingshire, writes

Q I would be grateful if you could help me with the AMSDOS disc format.

On examining the directory entry with a disc sector editor, I get a display such as

00 45 4E 56 45 4C 4F 50
45 42 41 53 00 00 00 4A
26 89 79 7A 7B 7E 8D 83
84 85 00 00 00 00 00 00

I realise that the highlighted hex digits refer to the track sector that the file (in this case *Envelope Bas*) is stored at. How can you convert these digits into track and sector numbers?

A CP/M disc (for this is what it is) is not set out in the way you might think. The file is split into portions that will fit into the available places on the disc. The directory tells the operating system where the various pieces are. The directory entry is read as follows

Byte	Contents	Meaning
0	00	Set to 0 if file is valid, E5 if erased
1	E	
2	N	
3	V	Eight
4	E	byte
5	L	filename
6	O	
7	P	
8	E	
9	B	Three byte
10	A	file
11	S	extension
12	00	Extent
13	00	s1
14	00	s2
15	4A	Number of records in this extent
16	26	The
17	89	rest
18	79	are
19	7A	allocation
20	7B	units
21	7E	which
22	8D	are
23	83	set
24	84	to
25	85	zero
26	00	if
27	00	they
28	00	are
29	00	unused
30	00	
31	00	

These 32 bytes tell the operating system all of the information it needs to know about the file. The filename and extension are obvious. Files are stored on disc as records of 128 bytes, each allocation unit represents 8 records, and there is space in one directory entry for 16 allocation units, hence 16*8*128=16384 bytes.

The extent entry is used when the file exceeds 16K. If this happens, another extent is opened up creating a new directory entry with the same filename and type but with the extent number set to one (or more if the file is really big, calling for more directory entries).

The allocation units are stored in the directory entry from byte 16 to 31 (16 entries as above) and each refers to a block of eight sectors each sector being 128 bytes long. The blocks are numbered sequentially from track 0 sector 0 through the last track and sector (depending on the density).

So to find where a file is stored on disc, look at the allocation units, and then read the eight consecutive sectors that each one points to. In your example, the first block is stored in block 26 (38 decimal) or sector 304 (38x8) just divide by the number of sectors per track to get the track number, the remainder is the sector on this track where the file starts. At the end of this block, use the next allocation number to work out the position of the next block.

When you get to the last block it may not be full. The remainder of the 'number of records' entry divided by 8 will tell you how many records are used.

The numbers s1 and s2 are used by the system for something but I don't know what, the number of records in the extent is exactly that on single density system (such as the 6128) but is a little more convoluted on double density systems.

Go to Print

P M Rainford Jnr of Llanbedr in Clwyd writes

Q Please could you tell me what is happening in this short program on the Commodore 64?

```
10 PRINT" "TIME
20 GOTO 10
```

A The Commodore 64 has a built-in clock that starts counting from zero when the machine is turned on. This 'Jiffy clock', as it is known, counts up at 60 times a second (even on British machines where the mains frequency is 50Hz) and is held in three bytes of memory, 160 161, 162, where 162 changes the fastest. *Print 65536*Peek(160)+256*Peek(161)+Peek(162)* is the same as *Print Ti*. The Commodore 64 only recognises the first two characters of any variable name so *Print Time* or *Print Tide* are the same as *Print Ti*, the *Me* or *De* being irrelevant to the machine.

The internal clock is fairly accurate but is somewhat dependent on whether any input/output operations are going on. Both the tape and disc will stop the clock when they are being used leading to inaccuracies.

Ti is also what is known as a system variable, ie, it is reserved for system use and updated by the system. Other system variables are *Ti$*, which can be used to set the jiffy clock to read the time of day.

Ti$="083031" sets the clock to 8 30 and 31 seconds making *Ti =1837860 [((18*60*60)+(30*60)+31)*60 jiffy s]*

Charts

Top Twenty

1	(5)	Go for Gold	**Americana**
2	(3)	Dragon's Lair	**Software Projects**
3	(1)	Super Cycle	**US Gold**
4	(4)	Speed King	**Mastertronic**
5	(6)	Thrust	**Firebird**
6	(12)	Ninja	**Mastertronic**
7	(–)	Trivial Pursuit	**Domark**
8	(2)	Dan Dare	**Virgin**
9	(8)	Ghosts and Goblins	**Elite**
10	(10)	ACE	**Cascade**
11	(11)	Ninja Master	**Firebird**
12	(7)	Kane	**Mastertronic**
13	(–)	Formula One Simulator	**Mastertronic**
14	(17)	Warhawk	**Firebird**
15	(–)	Parallax	**Ocean**
16	(9)	Knight Rider	**Ocean**
17	(20)	Green Beret	**Imagine**
18	(–)	Leaderboard	**US Gold**
19	(16)	Kick Start	**Mastertronic**
20	(18)	Nightmare Rally	**Ocean**

Figures compiled by Gallup/Microscope



In the lap of the Gods

David Wallin has news of multi-user game Gods, with a special offer for Popular readers

A while back we looked at a couple of BB multi-user games, including *Gods* This week we have a special *Gods* offer for readers of this column so it s time to look at the game in more detail There is a personal bias in this, I must admit, *Gods* is my favourite multi-player adventure, despite its joining-on fee of £23

Accessing Gods

Gods can be accessed by any 300/300 or 1200/75 terminal, although I find that 1200/75 works a lot better than 300/300 The number is 01 994 9119 and the protocol 8-bits no parity and one stop bit (standard BB protocol)

Free demo mode

To see if you like *Gods* (and you probably will), you can log on as a guest From the first menu you go to the Play option and enter guest when asked to, and then follow any on screen instructions

Most of the other people I have met on *Gods* are friendly and generally peaceable There is though, one thing that can turn even the most friendly people to murder that is an annoying guest

Guests have a habit of trying to kill other people, as there are plenty of weapons about for the violent people out there to find and kill with but most other players are peaceful and don't kill unless forced to

Other players are also helpful to the beginner When I first started, many others offered to give me guided tours of the area totally free, to help me They also offered tips when you are stuck which is useful It was the other players who taught me about 'valuing' items (see below) Offering items to the *Gods* (also see below) performing the 'ritual' in Blob s temple and other things that had at first baffled me

Treasure

When you find treasure you can value it to find what it s worth When you type *Value (items)* a little character appears, looks at it and tells you its worth in both magic points and gold

Treasure can be offered to a God in his temple Having asked the guard to take you there, you can type *Offer (item)* to give the item to the God What happens next depends on the value of the item If when valuing it you were told that the Gods would give you zero for it then the Gods will be cross with you If however, the item is valued above zero you will be given its value in magic points (called magical reserves)

The more items you offer the better your rank will be You start as Scum proceed to Salt-Of-The-Earth then to Second Class Citizen eventually, through Monk and Priest, to finally become a God There are many ranks and the above are just examples At the time of writing I am a Second Class Citizen, under the persona of Communicator

The 'ritual' mentioned above is a method of getting a lot of points even though you may not have much treasure yourself To find out more you ll have to play *Gods*

All good adventures have a maze and *Gods* is no exception In *Gods* the maze is the Kashab and it's easy as anything to get lost in it If you do get lost in the Kashab then keep typing *Out* Also there is a forest where you can get lost, but it is quite a bit easier to find your way out of the forest than the Kashab

At present, there are only two spells available *Where* and *Summon* They do exactly what you would expect *Where* tells you where an object/person is *Summon* will bring a person to you More spells are on their way Other commands include *Fight, Use Kill Get Value Offer, Kiss Bug Cry Say Shout, Help, Mount, Ring Bell, Guard Out* and many, many, more The command *Who* will tell you who is currently playing the game

The Bulletin Board

Running alongside *Gods* is a multi user Bulletin Board At present this is a very crude messaging system, where you can leave other players messages, but *Gods* is now running on a new computer and an upgraded BB is promised

Gods – the background

Gods is run by three people Tiger, Major Malfunction (The Major) and Lucy They form LOTG (Lap Of The Gods) Tiger who wrote the software built the hard ware etc, does most of the running

Until recently, *Gods* was running on a 68000 Xenix machine, now it has been upgraded to Uniplus, on a 'home-made' computer, consisting of bought in boards The *Gods* software (and hardware) is available for sale to budding MUG sysops, but don't expect it to come cheap! Also LOTG will write custom games to your own requirements and sell a multi-user Bulletin Board system

The charges on *Gods* are likely to change soon and an hourly playing charge be implemented when the game is finished so you d better join soon and make the most of the 'free' access time available

Joining Gods

To register you send your £23 to LOTG with some information about your computer and modem What you must do to register can be found out by Typing *H* at the first menu

Special Offer

As a reader of *Popular Computing Weekly's* Communications feature, you are entitled to a discount of £6 when joining *Gods* The cost for a *Popular* reader to join *Gods* is only £19 95 (including Vat)

You have three months to apply to join *Gods* at this special discount price After then, you will be required to pay the full price

To be entitled to this offer, you must quote the following on application

1) My Telecom Gold mailbox number (printed regularly on this page)
2) The reference dis/PCW/001
3) The volume and issue numbers of this copy of the magazine

You must include with your £17, you name address, signature, date and make/model of computer and modem You then should leave a message on the BB, to Tiger, with your name, address and cheque number (if applicable) You will be notified through the board of your account number and password as soon as your registration fee is received

The address to send off to for a discounted membership to *Gods* is: Discount Offer, Department PCW, Lap Of The Gods Ltd, 166 Portobello Road, London W11 2EB

SOFTWARE

SUMMER PRICES HELD UNTIL OCT. 31st

AMSTRAD PCW8256/8512

Hardware

256K RAM expansion quality tested components only — £25.00
Quality soft PVC Dust Cover Set only — £7.98
Printer ribbon £5.50 — 2 Ribbons £10.85
2nd Disk drive £145.25 — HARD DISK PHONE FOR DETAILS
CF2 Disks each £3.80 — CF2 Disks box of 10 £35.25 — RS232/Centronics £56.95

Software

Powerful dBASE 11 — £99.95
Versatile DELTA — £91.00
Comprehensive CAMBASE 2 — £40.44

PLEASE PHONE FOR ADVICE ON THE RIGHT DATABASE FOR YOU

MAP Integrated Accounts	£125.50	CAMSOFT Integrated System			£136.45
Cracker 2	£42.88	Scratchpad Plus	£58.25	SuperCalc 2	£43.70
Pocket Wordstar	£42.20	Newword 2 & Word +	£60.38	Microfile/word	£42.20
Prospell	£24.99	Typing Tutors Touch 'N Go & IANKEY			£21.80
Brainstorm	£44.95	Smartkey	£44.95	CHIT CHAT Combo	£87.99
DR CBASIC DR PASCAL DR DRAW DR GRAPH			£44.95	3D Clock Chess	£12.94

Quantity discounts available with 2 or more software packages

SINCLAIR QL

Super Q Board 512K NOW WITH THE EXCELLENT TOOLKIT 2 — £239.00
Super Q Board 512K with dual 3½" NEC Drives — £444.00
512K Expanderam £115.00 — 10 × 3½" DS/DD disks £25.00 — Serial cable £6.75

NEW ITEMS FOR PCW

Music & Sound Generator £34.99 — Joystick Interface £12.49
Electric Studio Light Pen £59.99 — Printer Extension £11.95

We now stock quality software and hardware for the BBC and IBM PC *Send S A E for details*

Prices include VAT & POSTAGE
PHONE FOR FURTHER DETAILS
All products are offered subject to availability

PERIPHERY
117 GAINSBOROUGH AVENUE, OLDHAM OL8 1AJ.
TELEPHONE: 061-626 5802

(38)

POSH LIST SPECTRUM 16/48K

[illegible]

NEW HORIZONS SOFTWARE

[illegible]

* * SPECIAL OFFER * *

[illegible]

QL BACKUP SUITE V5.3

Lo tup wi matters? What are they? Byte for by a di duplicator is keys for all known mel software has little as 1 min 30 no total. Detect invisible files dates and file len. Swap sv nge in file. Use re-locatable EPROM = [illegible] Fancy window editor 100K+ £9.95 to Steve Jones ZITASOFT 85 FOXBOURNE ROAD, LONDON SW17 8EN
PS Advise update pm V5.0 (43)

HOME ACCOUNTS

Put your house in order! Probably the best home use for your computer! Comprehensive coverage of bank accounts, credit cards, HP, standing orders etc. Inbuilt accuracy check for all transactions. Cashflow projection. For all Amstrads, Commodores and Spectrums.
£9.95 or FREE details from

DISCUS,
FREEPOST
ILFORD IG1 1BR
Tel: 01 514 4161
(24 hours 'live') (18)

GAP SOFTWARE

[illegible]

CONSOFT for QL

QDRIVE Microdrive recovery utility £9.95. Multitasking. Menu driven with instructions. Automatic recovery of dir. files deletions. File rebuild from sectors. Full Sector editor. View sorted map dir. sectors and headers. String search output to any device etc. Note Change of address. Cheque/P.O. to
CONSOFT, 11 Penarley Rd, Raleham Essex [illegible] (41)

FOR SALE

YAMAHA CX5M owners get 96 new voices! Venus bass sax effects synths/organ sounds for £4.50 PO. Put PCW on envelope. Paul Brown 19 Wren Road Sidcup Kent DA14 4LY

ATMOS/ORIC 1 48K Goldmine. Collect gold bars from 35 different mines only £2.50. David Yip 77 Great North Road Gosforth Newcastle NE3 2DD

CM8 64, 1541, C2N, Modem, sound sampler, Quickdisc, freeze frame, joysticks, £1000 software. Mainly top games but also utilities e.g. White Lightning Laser Compiler Easyscript and more. £520 o.n.o. Tel Slough 41211

SPECTRUM 128K plus £100 software £100 o.n.o. Opus Discovery disc drive (128) 4 months old £80 o.n.o. Tel 021 380 0188

COMMODORE 64, C2N, 2 books, joystick £110. 25 originals for C64 £40. Spectrum + and tape recorder £35. RAM Turbo joystick and cartridge interface + 9 ROM cartridges for use with any Spectrum £22. Tel 0272 644770

WANTED COMMODORE 128 or 128D Cash waiting. J D Hamon 190 Church Hill Road Cheam Surrey SM3 8NF Tel 01-644 5393

SERIAL 8056 PRINTER (Dixons) – unused apart from testing – complete with QL connector cable £90. Tel Harrogate (0423) 594209 evenings and weekend

SPECTRUM +, microdrive, centronics interface, brother HR 5 printer, microdrive backup unit, tape deck, joystick, some games. £220 the lot. Will separate. Serial 8056 printer £30. Tel 051 423 3391 between 6–7 pm

BLANK CASSETTES

WITH LIBRARY CASES

	C10	C15	C20	C30
10	3.80	4.00	4.15	4.60
20	7.00	7.30	7.40	8.20
50	18.00	16.20	15.60	17.50
100	27.00	28.00	30.00	33.00

Fully Inclusive (COD 80p extra)
Superior Tapes Own Set [illegible]

DISKS

[illegible]

MEMOTECH COMPUTERS AND ACCESSORIES

MTX 512 COMPUTER	[illegible]
DMX 80 PRINTER	[illegible]
RS232	[illegible]
PASCAL ROM	£36.00
SPECULATOR ROM	£38.00
1 mb. DISK DRIVE & INTERFACE	£160.00
1 mb. DISK DRIVE & INTERFACE	£210.00

All the above prices are inclusive. We stock [illegible]

UK HOME COMPUTERS
[illegible]

SOFTWARE

GOLDMARK SYSTEMS
UTILITIES FOR THE AMSTRAD

LORD OF THE RINGS
Side 1 of our conversion cassette will AUTOMATICALLY transfer the three games to disc including the screen. Side 2 is for NON-DISC owners and will reduce the loading time of around 15 mins to just under 3 mins

cassette £4.00

SPEED-TRANS
SPEED-TRANS is specifically designed to transfer many programs that have been protected with the SPEEDLOCK protection system. Contains full instructions to convert to disc

cassette £5.50

TRANSIT
The utility by Pride will copy individual files up to 42K in length from drive A-A, A-B, B-B and B-A. IT DOES NOT REQUIRE THE USE OF CPM and is a necessity for those with a 5¼ second drive. It is menu-driven and is easy to use. It is TRANSMATable to disc

cassette £4.00

VIEWTEXT
This utility by Pride will allow you to see the text in a BINARY file. It is particularly useful for games that require passwords (eg Hacker and other adventure games). It is TRANSMATable to disc

cassette £3.00

WHY WAIT AGES FOR YOUR PROGRAMS TO LOAD – Let us help you to convert them to disc. We have over 140 conversion routines, most using TRANSMAT by Pride Utilities. Phone or send for more information

UK prices shown. EUROPE add £1.00 per title. REST OF WORLD add £1.50 per title. We accept EUROCHEQUES (Sterling please)

GOLDMARK SYSTEMS, 51 COMET ROAD, HATFIELD, HERTS, ENGLAND. Tel 07072 71529 ANYTIME (14)

WE ARE GIVING AWAY
£1000

AMSTRAD CPC & SPECTRUM OWNERS
DO YOU ENJOY PLAYING GAMES?
CAN YOU SOLVE SIMPLE RIDDLES?
THEN YOU COULD WIN YOURSELF £1000

THE GAME OF THE CENTURY
ONLY £7.95 (add £1 overseas)

DISPLAY GRAFIX LTD
Unit B57, Northbridge Centre, Elm Street, Burnley, Lancs

AMSTRAD DISC USERS Tape Disc, Disc-Disc, Disc Tape, plus much, much more all on one disc for only £10.95 (add £1 overseas) (280)

LOOK

400/800 XL/XE NOW OR

ATARI OWNERS

SOFTWARE CLUB Up to 55% off software. Any micro. Free Software. Send for details to: Best-lise, 104 Elmshurst Gardens, Tonbridge TN10 3QZ

AMSTRAD SOFTWARE HIRE
Lowest Rates — Fast Service
OUR MEMBERS SAY WE ARE THE BEST
LATEST RELEASES — HUNDREDS OF TITLES
FREE MEMBERSHIP — JOIN NOW

AMSTRAD Genealogical database (disc) £35. Full details of 1000 people (10 marriages, 19 children) per file. Search (names, places, occupation, special comments etc.). Construct descent lines. Details Tel 061 439 4841

FOR SALE

COMPUTER HIRE
TO HIRE A COMPUTER AND/OR PERIPHERALS BY THE WEEK OR MONTH RING 01-607 0157 or 01 997 6457
WE SPECIALISE IN BBC AND ALSO HAVE A RANGE OF AMSTRAD COMPUTERS FOR HIRE
COMPUTER HIRE SERVICES
294A CALEDONIAN ROAD
LONDON N1 1BA

COMMODORE 128, 1570 drive, Alphacom 81 printer, datacassette, joystick, over £200 top utilities/games software and much more. All as new condition. Any reasonable offer. Tel Dave Naphill 2027 (Bucks)

COMMODORE 64 power supply only £15 plus postage. Tel 01-485 8383 for details

COMMODORE 64 1541 drive, colour monitor, joystick. Some books, some software. £475. Tel Drummond Winslow 3078. Anytime during the day

AMSTRAD SYSTEM: CPC464 colour machine with Disc Drive, DK Tronics 256k Silicon Disc, 256k RAM pack, selection of games and utilities including Tasword

ATARI CASSETTE DUPLICATOR Make back-ups of your tapes easily. Only £2.95 each. Send cheque/P.O. to: S Murray, 26 Edgehill Gardens, Pellerton, Aberdeen AB4 0ZE.

ADVENTURES FOR 48K Spectrum. Frankenstein only £2. Nightbeat only £3. Side B includes! Karl Crawford, 90 Westfield Avenue, Redcar, Cleveland TS10 1HG

YOUR PERSONAL CENTRONICS PRINTER

UNBEATABLE FROM **£99**

- DRAFT DOT MATRIX
- NEAR LETTER QUALITY
- SUBSCRIPT SUPERSCRIPT
- CONDENSE EMPHASIZE
- 96 CHAR+48 EURO+16 MATHS
- EPSON/IBM GRAPHICS
- OPTIONAL TRACTOR

ORDER NOW

ROCK HALL LIMITED
STATION RD, GLENFIELD
LEICESTER
TEL. 0533 313531
TELEX 341100

5¼" DISKS

SS/DD HIGH QUALITY 96DPI
(inclusive of hubring, envelopes, labels, etc.)

PACK OF 3	£3.50
PACK OF 10	£9.00
PACK OF 100	£65.00

3½" MICRO DISKS

PACK OF 5 (PLUS LABELS) £11.00
PACK OF 10 (PLUS LABELS) £20.00

5¼/3½" DISK CASES

LIBRARY CASE (HOLDS 10) £8.50
DESK ARCHIVE (HOLDS 25) £14.50
5¼" LOCKABLE (HOLDS 100) £13.50

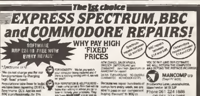
5¼" DISK SLEEVES

DURABLE REPLACEMENT SLEEVES IN 6 BRIGHT GLOSS COLOURS. PRICE
£1.50 PER 10
£8.00 PER 50
COLOURS: RED, MARIGOLD, GREEN (2), BLUE & PURPLE

ALL DISKS CARRY A LIFETIME REPLACEMENT GUARANTEE. ALL PRICES INCLUDE POSTAGE & PACKING. CHEQUES & POSTAL ORDERS TO

SIERRA VICTOR SOFTWARE
43 GREEDONRISE, SILEBY
LEICESTER LE12 7TE

SERVICES



DUPLICATION

CASSETTE COPIES

50 C10's FOR ONLY £40 INC P + P

FROM YOUR CASSETTE MASTER IN REAL TIME PLEASE PACK IN FOIL AND SEND CHEQUE TO:—

STUDIO 9000
CLEAR CROFT, BOTTOM LANE
IVER GREEN, BUCKS HP9 2UN
TEL. (04945) 5900



CHILTERN COMPUTER SERVICE

FOR FAST RELIABLE REPAIR SERVICE
SPECTRUM inc VAT & P&P £18.00
(inc parts VAT P&P)

WE ALSO REPAIR CBM 64 B BBC, VIC 20, BBC, AMSTRAD PRINTERS AND DISK DRIVES

CHILTERN COMPUTER CENTRE
98/100 HIGH TOWN ROAD
LUTON, BEDS TEL 0582 455684

FAULTY SPECTRUM?

As you are probably aware from press reports Sinclair Computers no longer have a repair department.

Our computer repair workshop has been an OFFICIAL Sinclair Repair Dept for the past six years and we are pleased to announce that we will continue to do your out of guarantee repairs as in the past.

Send your faulty computer **DIRECT**

SPECTRUM	£18.75 inc parts
ZX81	£11.50 inc parts
16K RAM	£9.95 inc parts
MICRODRIVE	£18.95 inc parts
INTERFACE 1-11	£18.75 inc parts

CALL OR SEND WITH CHEQUE OR P.O

T.V. SERVICES OF CAMBRIDGE LTD
FRENCH'S ROAD, CAMBRIDGE CB4 3NP
Tel: 0223 311371



FOR SALE

DISCS

AMSOFT 3" CF2		£29.90 per 10
AMSOFT 3" CF2DD		£58.90 per 10
ATHANA 5.25" DSDD 48tpi		£19.90 per 10
MAXELL 5.25" DSDD 48tpi		£17.90 per 10
MAXELL 5.25" DSDD 96tpi		£22.90 per 10
LVL 5.25" DSDD		£7.50 per 10
DYSAN 3.5" DSDD		£19.90 per 10
DYSAN 3.5" DSDD		£29.00 per 10
AMSTRAD PCW 2nd Drive		£125.00 each
AMSTRAD CPC 2nd Drive		£89.00 each
AMSTRAD CPC6128 Disc		£242.00 each
AMSTRAD PCW8256		£379.00 each
AMSTRAD PCW8512		£479.00 each
CUMANA 40/80	DSL DRIVE	£127.00 each
AMSTRAD	CPC6128 I/FACE	£57.30 each

Carriage inc. Please add 15% VAT

RUGBY MICRO SPARES
30 OXFORD ST, RUGBY
CV21 3NF (0788) 71643
Callers welcome by App

BARGAINS

Apricot 555 2 256k RAM 2 DSDD Drives plus Basic Wordstar Spellstar Mail Star Calc Star Infostar Data Star and Report Star software (make £300 plus)

555-2 only £348 plus VAT

555-2 plus M/RES Col Mon., £449 plus VAT

555 2 plus H/RES Col Mon. £548 plus VAT

SILICONE SERVICES
Tel. 0642 226945

HELP eliminate V.D.U. users head ache loss of concentration with a desk top negative ion generator. Special offer £37.95. Saving £2. Fully guaranteed. S.A.E. to Ionisers, 1 Hamond Hill, Chatham, Kent



- No high fixed price – you only pay what the repair actually costs
- While-U-Wait Service – spare parts for all leading computers – available over the counter
- State of the art test equipment to provide comprehensive test report and locate faults.
- Repairs to all leading makes of computer
- Amstrad specialist.
- Spectrum rubber keyboards repaired for only £8.95
- Commodore 64 s, Vic 20's, Atari, Commodore 16 s and Plus 4 s repaired
- Discounts for colleges, schools etc
- Every computer repaired by us is completely overhauled and tested before return
- All computers returned carriage paid and covered by insurance
- Three months guarantee included.
- **Free Software worth £35 with every Spectrum repair.**

A Simply send your computer securely packed, together with a cheque or postal order for the maximum fee to the address below. Your computer will be repaired and returned to you within 24 hours together with the balance of the fee and your FREE £35 worth of software

B Or if you prefer a written quotation just send £2.50 to cover post & packing

C Alternatively just quote your Access or Visa card number

DISCOUNT COMPONENTS
e.g. Power Transformers
Commodore £29.00 + £1.50 p p
Spectrum £9.95 £1.50 p p

AMSTRAD REPAIRS from £9 to £35

BBC REPAIRS from £12 to £35

SPECTRUM REPAIRS from £7 to £19.90

COMMODORE REPAIRS from £12 to £35

Trade orders welcome

SPECIALIST COMPUTER REPAIR CENTRE

Dept. 6, 28 College Street, WORCESTER WR1 2LS
Telephone: 0905-611072/613023

VISA Access

WE SET THE STANDARD BY WHICH EVERYONE ELSE IS JUDGED

There's a Dealer near you . . .

ESSEX

ESTUARY
PERSONAL COMPUTERS

316 CHARTWELL NORTH
VICTORIA CIRCUS SHOPPING CENTRE
SOUTHEND ON SEA
Tel (0702) 614131

NOSLES
14-17 EASTERN
ESPLANADE
SOUTHEND-ON-SEA,
ESSEX
Tel: (0702) 63377/8

GLASGOW

THE COMPUTER DEPOT
205 BUCHANAN STREET
GLASGOW G1 2JZ
Tel (041) 332 3944

MEGABYTE
12 ETTRICK SQUARE
CUMBERNAULD
G67 1ND
0236 736396

INTERCHIP
3 MILLER STREET
GLASGOW
Tel: 041-248 6667
Dealers for Amstrad/Atari and PC clones

KENT

ANIROG COMPUTERS
29 West Hill
Dartford
Kent
Tel: (0322) 91649

MICROWAY COMPUTERS
39 HIGH STREET
RAINHAM, KENT
Tel: (0634) 376702

LEEDS

COMPUTER WORLD
NORTHWOOD HOUSE
NORTH STREET
LEEDS LS7 2AA
Tel: (0532) 450000

LONDON

GALLERY SOFTWARE
1st FLOOR
THE ARNDALE CENT,
WANDSWORTH,
LONDON SW18
Tel: 01-870 4941

GAMES WORLD
129 KING STREET
HAMMERSMITH
LONDON W6
Tel: 01-741 6457

LIVERPOOL

NABITCHI COMPUTING
SPECIALISTS IN AMSTRAD
PCW8256 – PCW8512
SOFTWARE & HARDWARE
MERSEYSIDE INNOVATION CENTRE
131 MOUNT PLEASANT
LIVERPOOL L3 5TF
051-709 0123/706 8775
Software Design Service Available

Microbyte
We talk business not bits & bytes
NO 1 ON MERSEYSIDE FOR
ATARI AND AMSTRAD
71 SEAVIEW ROAD WALLASEY
MERSEYSIDE L45 4QW
(051) 630 6933/638 1420
10 am – 6 pm
MAIL ORDER
SERVICE AVAILABLE

YORKSHIRE

YORK COMPUTER CENTRE
7 STONEGATE ARCADE
YORK
Tel: (0904) 641862

NORFOLK

THETFORD MICROS
SPECIALISTS –
COMPUTER REPAIRS
21 GUILDHALL STREET
THETFORD
NORFOLK
(0842) 61645

HEREFORDSHIRE

HONEYSETT COMPUTERS
17 UNION STREET
HEREFORD HR1 2BT
Tel: (0432) 279404
ASK ABOUT
CLUBBER SALE

SURREY

ULTIMA
UNIT 28
WHITE LION WALK
GUILDFORD
(0483) 506939

POSITRON COMPUTING
15 CENTRAL PRECINCT
LLANELLI
SA15 1YE
0554 759624
AMSTRAD 8256
UPGRADE

SUSSEX

GATWICK COMPUTERS
62 THE BOULEVARD
CRAWLEY, SUSSEX
Tel: (0293) 26240/37842

COMPSWAP

ATARI 520 STM with SF354 disk drive as new lattice C computer. Also games and spare disks worth over £800. Sell for £350. Tel. Richard Dunstable 61694. Must collect

AMSTRAD 6128 colour screen perfect cond ban hardly used – £300 with Hitchhikers Guide and over £200 of original software + discs etc. Tel 08837 2461 evenings and weekends

WANTED Commodore 1520 printer/plotter. Will pay up to £30. Write to Martyn Symonds, Delta Cottage, Ley Lane, Minsterworth, Glos GL2 8JU

BBC-B OBI 2 basic 2 plus software magazines and joystick. £250. Tel Doncaster (0302) 531815

TASSPELL, Tasprint + Tascopy. Cost £1 000, yours for £500 o n o. Tel John 01 211 3301 (office hours)

HELP eliminate V D U users headache, loss of concentration. With a desk top negative ion generator special offer £37 95. Saving £2. C O D 0634 45734

ACORN ELECTRON with tape recorder joystick and interface. Loads of software. Perfect condition – £70. Ring Ware (0920) 822740 evenings

AMSTRAD CPC 464 with colour monitor, disk drive, disk wizard and two joysticks. Loads of business & games. Software on tape & disk. £320. Ring Ware (0920) 822740 evenings

COMMODORE 64 computer 1541 disk drive. Hitachi colour 14" colour T V. Commodore modem. MPS801 printer. Lots of software, books, magazines. £450. Tel 01 642 9574

QL, DISC interface, parallel printer interface, two joystick adaptors, software including Assembler Editor. New green monitor. Advanced user guide. Sinclair technical guide, magazines. Offers about £280. Details Tel Leeds 713060

COMMODORE 64 + disk drive 1541 + printer MPS801 + table + 6 branch socket. All boxed. Just out of guarantee. Word processor + 8 games. £300. Tel 0273-27637 evenings

BBC B 1208 DFS Word Rom. Zenith green screen monitor, Cumana twin DS 40/80 track drive. Canon NLQ printer £575 o n o. Tel 01 541 9618 in God timing 5079 evenings

CBM MPS803 dot matrix printer few months old, excellent condition – genuine reason for sale (sold CBM 64). Printer paper included. Bargain at £80 (Would cost £150 new.) Tel Julian 0552 34557 daytime

GAC PROBLEMS? Free help from experienced writers. Just send details of difficulties plus large S A E. Also Writer's Magazine, Player's Magazine £1 00 each monthly. Adventure Contact, 13 Hollington Way, Wigan WN3 6LS

FOR SALE! Memotech MTX512 Sidewinder, Mig Alley Ace (Atari discs), Spy v Spy, Nightshade, Knight Lore, Aliens, Underwurlde, White Lightning, Sherlock (Spectrum), Sidekick (IBM PC and Clones). Tel 01 733 3256

SINCLAIR Interface One £25, Microdrive £25. Mint condition. Both in boxes, unused. Instructions. Write to Paul Rowe, 16 Townend Close, Treeton, Rotherham, South Yorkshire

AMSTRAD 6128 green screen little used. Protext, Baumword, some games, joystick, 8 bit KAS. £190. Tel Kingswinford 279687

AST ONE MET DISK DRIVE for Atari ST 3½in, also MSX and 2 cartridges, both as new, for sale. Offers. Tel West Wratting (Cambs) 022 029 830

New Releases

Pick of the week

John Cook looks through this week's new arrivals

Amiga

Program *Instant Music* **Type** Utility **Micro** Amiga **Price** £29 95 **Supplier** Ariolasoft, 68 Long Acre, London WC2E 9JH

Program *Archon II* **Type** Arcade/Strategy **Micro** Amiga **Price** £29 95 **Supplier** Ariolasoft, 68 Long Acre, London WC2E 9JH

Program *Adventure Construction Set* **Type** Utility **Micro** Amiga **Price** £29 95 **Supplier** Ariolasoft 68 Long Acre London WC2E 9JH

Program *Skyfox* **Type** Arcade **Micro** Amiga **Price** £29 95 **Supplier** Ariolasoft, 68 Long Acre London WC2E 9JH

Program *Arctic Fox* **Type** Arcade **Micro** Amiga **Price** **£29 95** **Supplier** Ariolasoft, 68 Long Acre London WC2E 9JH

Amstrad CPC

Program *The Inheritance (Panic in Las Vegas)* **Type** Adventure **Micro** Amstrad CPC **Price** £9 95 (tape) £14 95 (disc) **Supplier** Infogrames, Mitre House Abbey Road, Enfield, Middx EN1 2RQ

Program *Questor* **Type** Arcade Adventure **Micro** Amstrad CPC **Price** £8 95 (tape) £13 95 (disc) **Supplier** Cascade Games, Harrogate, North Yorkshire

Program *Nemesis Adventures* **Type** Adventure **Micro** Amstrad CPC **Price** £13 95 (disc only) **Supplier** Advantage 33 Malyns Close Chinnor Oxon OX9 4EW

Program *Advantage C* **Type** Language Compiler **Micro** Amstrad CPC **Price** £39 95 (disc only) **Supplier** Advantage, 33 Malyns Close, Chinnor, Oxon OX9 4EW

Program *Virgin Atlantic Challenge* **Type** Arcade **Micro** Amstrad CPC **Price** £8 95 **Supplier** Virgin Games, 2/4 Vernon Yard, Portobello Road, London W11 2DX

Amstrad PCW

Program *Advantage C* **Type** Language Compiler **Micro** Amstrad PCW **Price** £39 50 **Supplier** Advantage 33 Malyns Close Chinnor Oxon OX9 4EW

Atari

Program *Raid Over Moscow* **Type** Arcade **Micro** Atari XL/XE **Price** £9 99 (tape) £14 99 (disc) **Supplier** US Gold, Unit 2/3 Holford Way, Holford Birmingham B6 7AX

Commodore 64

Program *Asterix and the Magic Cauldron* **Type** Arcade **Micro** Commodore 64 **Price** £9 95 (tape) £14 95 (disc) **Supplier** Melbourne House, 60 High Street Hampton Wick Kingston Upon Thames, Surrey KT1 4DB

Program *Orpheus in the Underworld* **Type** Arcade **Micro** Commodore 64 **Price** £1 99 **Supplier** Alpha-Omega, CRL Group, 9 Kings Yard, Carpenters Road, London E15 2HD

Program *Robobolt* **Type** Arcade **Micro** Commodore 64 **Price** £1 99 **Supplier** Alpha-Omega CRL Group 9 Kings Yard, Carpenters Road, London E15 2HD

Deus ex Machina

Program *Deus ex Machina* **Type** Weird Arcade **Micro** Amstrad CPC **Price** £8 95 **Supplier** Nu Wave, CRL House, 9 Kings Yard, Carpenters Road London E15 2HD

You have to hand it to the guys at Automata – they have their moments

I still miss Christian Penfolds displaying his manhood in that baggy pink jogging suit every Microfair – thinly disguised as the Pi-man

But Automata's creative tool the man with his feet firmly on the artistic and ideological tiller was always Mel Croucher

A man of many opinions, whose documented thoughts start at 'semi visionary' move hastily through 'wall observed' and more often than not don't stop till they get to crass – love him or hate him, the guy has imagination And as far as computer software goes, that imagination reached its pinicle with *Deus ex Machina*

More like a concept album than a compilation *Deus* is a collection of fairly original but simple arcade games linked together by their abstract futurist setting This alone would be of interest, but the action proceeds along with a synchronised soundtrack of words (credits include Jon Pertwee and Frankie Howerd) and music (Croucher)

The result had our office full of amazed people at one time – but commercially it was a flop

Who knows why, but it's out now on Amstrad CPC and MSX formats, marketed by CRL's Nu Wave label At this price a bargain go out and grab yourself a piece of computing history

Program *Warhawk* **Type** Arcade **Micro** Commodore 64 **Price** £1 99 **Supplier** Firebird 64–67 New Oxford Street London WC1 1PS

Program *Dante's Inferno* **Type** Arcade/Adventure **Micro** Commodore 64 **Price** £9 95 **Supplier** Beyond, 64–67 New Oxford Street, London WC1

I had no idea that mediaeval scholars used PCW 8256s But here we are, at the beginning of an epic and terrifying journey through the nine circles of Hell and where do we start? Limbo

Well obviously Dante knew a thing or two, and his classic work *Inferno* has now received the ultimate acolade the 20th century can give a literary masterpiece – along with such exalted company as *Adrian Mole* and the *Fourth Protocol* for instance – in that it has become the subject of a computer game

Programmed by Denton Designs (now minus founder members Cain and Everett) *Inferno* has you controlling pilgrim (dressed as all good pilgrims are, in raggedly cut hessian) through the nine circles of Hell to reach Purgatory on the other side – which is where some would say Beyond have been for quite some time

The game is really a series of mazes and puzzles each maze inhabited by different creatures and hazards, with problems to solve at almost every step

The graphics are well designed and the renaissance type sound track is refreshingly different – however, the unkind soul that shouted 'It's like Sabre Wulf with knobs on,' from the back of the office had a point

No well presented and atmospheric though this particular arcade adventure is it is not the program to pull Beyond out of the doldrums But just wait till you see *Infodroid* and *Star Trek*

Dragon

Program *Tanglewood* **Type** Adventure **Micro** Dragon/Tandy CoCo 32K **Price** £5 96 **Supplier** Microdeal, PO Box 68, St Austell Cornwall PL25 4YB

Program *Wizards Quest* **Type** Arcade **Micro** Dragon/Tandy CoCo 32K **Price** £5 95 **Supplier** Microdeal PO Box 68 St Austell, Cornwall PL25 4YB

Program *Cuthbert and the Golden Chalice* **Type** Arcade **Micro** Dragon/Tandy CoCo 32K **Price** £5 95 **Supplier** Microdeal PO Box 68 St Austell Cornwall PL25 4YB

Program *The Thirteenth Task* **Type** Adventure **Micro** Dragon 32/64 **Price** £3 00 (incl p&p) **Supplier** Arc Software 272 Mearns Road Newton Mearns, Glasgow G77 5LY

MSX

Program *Deus ex Machina* **Type** Weird Arcade **Micro** MSX **Price** £8 95 **Supplier** Nu Wave CRL House 9 Kings Yard Carpenters Road, London E15 2HD

QL

Program *War in the East (Scenario 1 Barbarossa)* **Type** Strategy **Micro** QL **Price** £19 95 **Supplier** TK Computerware Stone Street, Stanford Ashford Kent TN25 6DF

Program *War in the East (Scenario 2 Stalingrad)* **Type** Strategy **Micro** QL **Price** £19 95 **Supplier** TK Computerware Stone Street, Stanford, Ashford, Kent TN25 6DF

Program *War in the East (Scenario 3 Destruction of Army Group Centre)* **Type** Strategy **Micro** QL **Price** £19 95 **Supplier** TK Computerware Stone Street Stanford, Ashford, Kent TN25 6DF

Program *War in the East (Scenarios 1–3)* **Type** Strategy **Micro** QL **Price** £39 95 **Supplier** TK Computerware, Stone Street, Stanford, Ashford, Kent TN25 6DF

Spectrum

Program *3D Game Maker* **Type** Utility **Micro** Spectrum **Price** £8 95 **Supplier** CRL Group 9 Kings Yard Carpenters Road London E15 2HD

Program *Oblivion* **Type** Arcade **Micro** Spectrum **Price** £1 99 **Supplier** Alpha Omega CRL Group 9 Kings Yard Carpenters Road London E15 2HD

Program *Xeno* **Type** Adventure **Micro** Spectrum **Price** £1 99 **Supplier** Alpha Omega, CRL Group 9 Kings Yard, Carpenters Road, London E15 2HD

Program *Adventure Builder* **Type** Utility **Micro** Spectrum **Price** £4 95 **Supplier** Alpha CRL Group, 9 Kings Yard Carpenters Road London E15 2HD

Program *Bombscare* **Type** Arcade/Adventure **Micro** Spectrum **Price** £1 99 **Supplier** Firebird, 64–67 New Oxford Street, London WC1A 1PS

Program *The Happiest Days of Your Life* **Type** Arcade/Adventure **Micro** Spectrum **Price** £1 99 **Supplier** Firebird, 64–67 New Oxford Street, London WC1A 1PS

Program *Dr What* **Type** Adventure **Micro** Spectrum **Price** £7 95 **Supplier** CRL, 9 Kings Yard Carpenters Road, London E15 2HD

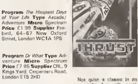
Program *3D Starstrike* **Type** Arcade **Micro** Spectrum **Price** £2 99 **Supplier** £2 99 Classics Elite, Anchor House, Anchor Road Aldridge, Walsall WS9 8PW

Program *Thrust* **Type** Arcade **Micro** Spectrum **Price** £1 99 **Supplier** Firebird, 64–67 New Oxford Street, London WC1A 1PS

Here it is at last – the Spectrum conversion of that number one top selling second cousin of *Asteroids* and *Gravitar* we were all going crazy about earlier in the year – *Thrust*

The graphics are similar rather than identical but the basic layout of each cavern level has been retained Not bad so far, but how does it play?

The original version of *Thrust* on the Commodore (and that excellent clone on the BBC) relied heavily on playability and you'll be pleased to learn that the Spectrum version does capture some of that although if you have tried the others you'll notice that the feel of the ship as you traverse the caverns is slightly inferior Extras include definable keys and a message on screen telling you when the limpet guns are deactivated



Not quite a classic in its own right, but still worth getting

Program *Prodigy* **Type** Arcade/Adventure **Micro** Spectrum **Price** £7 99 **Supplier** Electric Dreams, 31 Carlton Crescent Southampton SO1 2EN

Prodigy is its name "A game which demands compassion guts and intelligence in ways no other game does You bet since your tasks include cleaning, feeding and generally protecting a human baby, with you (Solo – a synthetic man and no, it doesn t mean you wear a lot of polyester) attempting to lead the kid through the laboratories of the machine sorcerer Wardlock Seeing as it is infested with sundry genetic horrors it s no doddle

With a very nice 3D scrolling display and some well animated meanies (at least one lot inspired by those eyes from *Highway Encounter*) one thing you can t call this game is stereotypical

As you wander around the playing area your human charge follows you unerringly just like a smaller brother or sister tends to do when you want to go off and do something illicit

Certainly conceptually out of the ordinary and technically well done, the only question is, lads can your gender identity take it?

The selling game

What's the difference between a budget game and a full price game? Okay, I'll run that one past you again – what's the difference between a budget game and a full price game, apart from seven or eight quid?

I see this is confusing you, let's try it another way. Was the last full price game you bought five times better than the last budget game you bought? That's one way of looking at it, yet my pet marketing expert tells me the real difference between full price and budget is actually where the product is sold.

When something as crazy as that may well have several grains of truth in it, maybe it's time to examine what's going on.

When the games market started, no-one had much idea about anything and the concept of 'price points' for computer software was still a twinkle in the eyes of as yet unappointed marketing managers.

Experienced business people had yet to take home computers seriously, and the wacky entrepreneurial/programmer types just cranked the stuff out for what they thought would sell. Looking at some 3½ year old *Populars*, that opinion seemed to vary from £4 to £10.

However, things started to change when glossy ads and full colour cassette inlays were invented – games were suddenly a youth culture industry. Enter the professionals.

Professionals know that for each kind of product there is a price which the consumer likes. Not too expensive – as you need to maximise your profit without losing too many sales. But there again not too cheap, or the consumer will believe the product to be worthless. This is known as a price point.

For software, this appeared to be around £9 for Spectrum games and £10 for Commodore 64/Amstrad CPC (after all, they paid more for their machines, didn't they?)

As the Industry boomed, everyone who programmed for the right machines prospered and was happy. Then in 1984 came budget software, pioneered by Mastertronic. The professionals laughed.

In 1986, one in five games sold is a Mastertronic game, four out of 10 games sold is a budget title and this time next year it'll be at least six out of 10. So what's gone wrong with the status quo?

What Mastertronic realised first – and others are realising now – is that what was considered the industry price point is just too high. The punters (that's you and me) are reluctant to pay out large sums of money for a product of indeterminate quality.

High prices do not guarantee high quality (eg, *The Great Space Race*), so why bother? At least if a £1.99 game is a dud, you haven't blown a month's pocket money.

Now that budget software has developed so that it consistently overlaps with 'full price' in terms of quality, there are even more problems.

An industry figure I was talking to recently was mystified. "They seem to be selling a full price product at budget prices." I would put it the other way around. As the quality of budget software increases, it is harder for other companies to justify the 'traditional' price tag of a tenner.

Computers are no longer whoosh goes the rocket gadgets – they are simply everyday consumer items, and twice the price of an LP is too much for a single computer game, unless the quality is considerably above that of budget level – and that is seldom the case (adventures and complex strategy games may be an exception here).

"But if we sold our products cheaper, we would go out of business," I hear the cry.

Well, I don't see Mastertronic rapidly going down the tubes. The fact is that lower prices would mean increased sales, less copying and more interest in the hobby.

There will always be the *Elites* of this world – well worth the money – but as far as the run-of-the-mill releases are concerned, the average price should be lower. How about it, then? Never mind the profit margin, just feel that turnover.

John Cook

NEXT WEEK

Special Supplement Micros and Music

The music supplement is packed with reviews of the latest products – the Spectrum Midi synthesiser/sampler/drum machine from Ram Electronics, Cheetah's sound sampler, Kuma's *K Minstrel* music editor, and the Amstrad *Advanced Music System*. Plus news from the States of all the forthcoming Commodore and Atari music packages.

Hardware

The reviews of Comx's PL80 printer/plotter and the Fantastick 2 joystick, which had to be omitted from this issue due to lack of space, will be appearing in the October 2 issue. The Comx PL80 is both Commodore and PC compatible, while the joystick can be used with a wide range of micros.

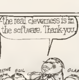
Star Glider

At long last, Rainbird's *Star Glider* is finished and ready for release. We bring you a full review.

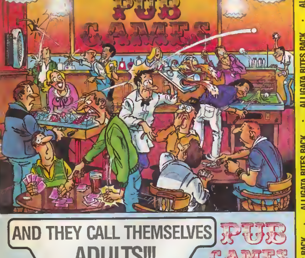
Competition

The last science fiction movie stills for you to identify in our great autumn giveaway.

Hackers






PUB GAMES



VERSION
'FLIGHT SIMULATOR OF THE YEAR'
OUT NOW —
SPECTRUM VERSION £9.95
PLUS/4 DISK VERSION £12.95
FREE POSTER WITH EVERY COPY
ACE
"AT LAST YOU CAN REALLY FLY!"
RAF PILOT
"I JUST COULDN'T BELIEVE HOW MUCH THERE WAS IN IT"
"ACE IS ONE OF THE BEST SIMULATORS I HAVE EVER PLAYED"
"THERE ARE FLIGHT SIMULATORS AND THERE ARE FLIGHT SIMULATORS — AND THEN THERE'S ACE"
COMPUTER AND VIDEO GAMES
COMMODORE 64/128
CASSETTE £9.95
DISK £12.95